

Subject Index

Absorption

Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768

Improvements in Soil Absorption Trench Design, 193

Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

Abutments

Abutment Pile Design for Jointless Bridges, 960

Acceleration

Accelerating Electrons, 1211

Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416

Access control

Buying Tomorrow's Water, 1216

Accident factors

Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039

Accident prevention

General Aviation Collision-Avoidance Alternatives, 1047

Accidents

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039

Accounting

Cost-Estimating Principles, 95

Accuracy

Accuracy of Estimated Reference Crop Evapotranspiration, 730

GPS-Guided Vision Systems for Real-Time Surveying, 998

Small-Scale Model Tests of Structural Steel Assemblies, 906

Acetate

Effects of Prezonation on Anaerobic Biodegradability of O-Cresol, 160

Acid rain

Power Without Acid, 1237

Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203

Acidic water

Modeling Thermal Stratification in Transparent Adirondack Lake, 1099

Acoustic detection

Measurement and Description of Tensile Fracture in Granite, 382

Acoustic measurement

Acoustic Measurement of River Discharge, 603

Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459

Acquisition

They're Coming to America, 1280

Activated carbon

Adsorption Kinetics in GAC Systems for Water Treatment, 147

Parameter Evaluation for Carbon Adsorption, 148

Particle Size and Shape Effects on Adsorption Rate Parameters, 143

Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

Activated sludge

Mitigation of Biological Process Upsets Caused by Organic Inhibitors, 204

Project Peer Review for Deer Island Secondary Treatment Planning, 247

Active control

Active Optimal Control of Structure Using Optimal Observer, 421

Control Systems of Building Structures by Active Cables, 959

Experimental Study of Active Control for MDOF Seismic Structures, 363

Structural Control by Temporal Finite Elements, 35

Adaptive systems

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Use of Binary Choice Decision Process for Adaptive Signal Control, 1033

Adhesive bonding

Combined Stress Behavior of Structural Glazing Joints, 858

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Admixture

A Hard Look at Concrete, 1178

Admixtures

Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Adsorption

Adsorption Kinetics in GAC Systems for Water Treatment, 147

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

Parameter Evaluation for Carbon Adsorption, 148

Particle Size and Shape Effects on Adsorption Rate Parameters, 143

Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174

Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186

Aeration

- Big Trouble in Little America, 1249
- Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439
- Estimating Estuarine Reaeration Rates, 205
- Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194
- Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166

Aerodynamics

- Aerodynamic Model Tests of Tall Buildings, 300
- Deterministic Model for Wind-Induced Oscillations of Buildings, 272
- Mapping and Synthesis of Random Pressure Fields, 407
- Mitigation of Wind Effects on Aerospace Launch Facilities, 24
- Transient Wind-Induced Internal Pressures, 355
- Wind Induced Vibration of Two Flexible Cylindrical Structures, 392
- Wind Response Spectrum, 390

Aerospace transport

- Mitigation of Wind Effects on Aerospace Launch Facilities, 24

Aerotriangulation

- Recent Advances in Kinematic GPS Photogrammetry, 984

Africa

- Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63
- Evapotranspiration in Sudan Gezira Irrigation Scheme, 732

Age factors

- Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022

Aggregates

- Setting Stresses in Polymer Composites with Multiple-Size Particles, 784
- Sludge Ash as Lightweight Concrete Material, 144

Aggregation

- Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580

Aging

- Effect of Early Freezing on Permeability of Cement Paste, 778
- Solidification Theory for Concrete Creep—I. Formulation, 368
- Solidification Theory for Concrete Creep II. Verification and Application, 369

Agreements

- Project-Labor Agreements in Construction Industry, 97

Agricultural economics

- Economics of Selenium Removal from Drainage Water, 662
- Evaluation of Irrigation Planning Decisions, 663
- Water Resources Management in North China Plain, 1109

Agricultural engineering

- Analytical Model of Level Basin Irrigation, 664
- Cropland Measurement Using Thematic Mapper

Data and Radiometric Model, 32

- Irrigation Impact on Groundwater: Model Study in Humid Region, 720
- Potential of Irrigated Agriculture in Syria, 1093
- Systems Analysis of Tank Irrigation: I. Crop Staggering, 687

Agricultural pollutants

- Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Agricultural wastes

- Agricultural Drainage Water—How Should it be Regulated in California?, 657
- Economics of Selenium Removal from Drainage Water, 662
- Irrigation-Induced Contamination: How Real a Problem?, 658
- Regulation of Agricultural Drainage to the San Joaquin River, 660

Agriculture

- Agriculture and Groundwater Quality, 1242
- Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717
- Future Irrigation Prospects and Actions in Developing World, 706
- Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
- Potential of Irrigated Agriculture in Syria, 1093
- Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
- Water Resources Management in North China Plain, 1109

Air classifiers

- Variable Injection Active-Pulse Air Classification, 164

Air entrainment

- Effects of Air Entrainment on Plunge Pool Scour, 573
- Freeze-Thaw Deterioration of Concrete Pavements, 776

Air flow

- Measurement of Upwelling Flow from Air Diffuser, 220

Air pollution

- Environmental Engineering, 1316
- Kinetics of Reaction of SO₂ with Marble, 773
- Noise and Air Pollution of High Speed Rail Systems, 1016
- Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202
- Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203

Air pollution control

- CO Modeling in Alaska, 140
- Environmental Engineering Infrastructure: Problems and Needs, 225
- Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203

Air routes

- Hubbing and Airline Costs, 1053

SUBJECT INDEX

Analysis

Air temperature

Accuracy of Estimated Reference Crop Evapotranspiration, 730

Air traffic

General Aviation Collision-Avoidance Alternatives, 1047

Air transportation

Hubbing and Airline Costs, 1053

Air water interactions

Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174

Simulation of Wind-Induced Water Currents, 616

Aircraft

General Aviation Collision-Avoidance Alternatives, 1047

Airlines

Hubbing and Airline Costs, 1053

The Jet Set, 1283

Airport construction

Impact Analyses of Construction of Kansai International Airport, 1062

Airport runways

Binders for Snow Roads and Runways in Antarctica, 131

Airport terminals

Hubbing and Airline Costs, 1053

Alaska

Alaska's Infrastructure and Limits to Growth, 127

CO Modeling in Alaska, 140

Moisture Accumulation in Insulated Walls in Cold Regions, 130

Note on Nearshore Ice Gouge Depths in Alaskan Beaufort Sea, 137

Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136

Algae

Direct Filtration of *Chlorella* with Cationic Polymer, 161

Effect of Concentration Boundary Layer on Carbon Limited Algal Biofilms, 159

Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Variability in Photosynthesis: Impact on DO Models, 197

Algal control

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Algorithms

Characteristics and Computational Procedure in Softening Plasticity, 364

Experimental Study of Active Control for MDOF Seismic Structures, 363

Network Flow Algorithm Applied to California Aqueduct Simulation, 1050

Nonlinear Mixed-Discrete Structural Optimization, 822

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Rainfall Intervention Analysis for On-Line Applications, 1096

Alignment

Computer-Aided Design for Horizontal Alignment, 1042

Alkaline soils

Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692

Alluvial channels

Applicability Index for Sand Transport Equations, 644

Guide for Estimating Riverbed Degradation, 571

Width of Straight Alluvial Channels, 568

Alluvial streams

Mathematical Modeling of Fluvial Sand Delivery, 1144

Mobile-Bed Friction at High Shear Stress, 598

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Universal Bank Erosion Coefficient for Meandering Rivers, 593

Alluvium

Scour-Depth Prediction Under Armoring Conditions, 633

Aluminum

Lateral Buckling in Curtain Wall Systems, 934

Ammonia

Daily Average Value of Un-ionized Ammonia from Field Measurements, 219

Effect of Wastewater Application Device on Ammonia Volatilization, 218

Amplitude

Diffraction of SV Waves by Circular Canyons of Various Depths, 389

Anaerobic digestion

Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211

Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212

Anaerobic processes

Effects of Prezonation on Anaerobic Biodegradability of O-Cresol, 160

Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207

Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210

Analysis

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Analysis of Natural Waves by Local Approximations, 1148

Analytic Solutions for Tidal Model Testing, 655

Analytical Model for Longitudinal Soil Vibration, 463

Analytical Modeling of Phase 2 Steel Structure, 903

Analytical Solution of Magnetic Declination Problem, 1004

Analyzing in 3D, 1196

Bearing Capacity of Footings Adjacent to Slopes, 477

Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708

Crack Control in Beams Using Deformed Wire Fabric, 945

Eccentrically-Obliquely Loaded Footing, 542

Incremental Resistance and Deformations of Elastoplastic Beams, 861

Least-Weight Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874

Microcomputer-Aided Analysis and Design of Steel Frames, 109

Modeling Solute Transport by Centrifugation, 171

Multicriterion Analysis of Hydropower Operation, 445

Nonlinear Seismic Analysis of Arch Dams, 310

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216

Shear and Normal Stresses in Adhesive Joints, 415

Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486

Submergence Factors for Hydraulic Turbines, 442

Use of STABL Program in Tied-back Wall Design, 476

Analytical techniques

Analytical Solution of Magnetic Declination Problem, 1004

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

Velocity Redistribution in Meandering Rivers, 611

Anchor piles

Soil Resistances to Embedded Anchor Chain in Soft Clay, 526

Anchorage

Interior Joints with Variable Anchorage Lengths, 921

Anchors

Elastic Stiffness of Flat Anchor Region at Cracked Geological Interface, 263

Anisotropic plates

Stability of Antisymmetric Angle-Ply Laminated Plates, 321

Anisotropic soils

New Drain Flow Formula, 675

Yield Function for Soil with Anisotropic Fabric, 267

Anisotropy

Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823

Anisotropic Nature of Jointed Rock Mass Strength, 295

Low-Stress Dilation Test, 489

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456

Slip Mechanism-Based Constitutive Model for Granular Soils, 311

Spheroidal Cavity with Prescribed Asymmetric Tractions in Three-Dimensional Transverse Isotropy, 10

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297

Antennas

GPS Antenna Design Characteristics for High-Precision Applications, 978

GPS Antenna Set-Up Procedures and Error Sources, 1002

Kinematic GPS Land Survey—Description of Operational Test and Results, 987

Application methods

Effect of Wastewater Application Device on Ammonia Volatilization, 218

Approximation

Exact or Lower Bound Tapered Column Buckling Loads, 851

Stem Waves Along Breakwater, 1163

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Approximation methods

Analysis of Natural Waves by Local Approximations, 1148

Approximate Analysis of Twisted Parallelepiped, 275

Potential Errors in Approximate Methods of Structural Analysis, 845

Aquariums

A Seawall for Sea Mammals, 1183

Aqueducts

Aqueduct and Reservoir Capacities for Distribution Systems, 1106

On Least-Cost Design of Aqueduct Systems, 1102

Rebuilding Roebling Delaware Aqueduct Bridge, 865

Aquifer tests

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650

Aquifers

Bioremediation: Testing the Waters, 1247

Chance-Constrained Model for Management of Stream-Aquifer System, 1088

Diagnostic Model of Dispersion in Porous Media, 562

Evaluation of Deep Pumping Tests, 484

Irrigated Agriculture and Water Quality in the East, 719

Nonlinear Flow Toward Wells, 561

Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Simple Groundwater Laboratory Models, 597

Step-Drawdown Data Analysis, 634

Water Resources of the GCC: International Aspects, 1103

Arbitration

A Better Way, 1292

SUBJECT INDEX

Assessments

Excellence in the Constructed Project, 1317

Arches

Arch in Soil Arching, 469

Asymmetrical Buckling of Prestressed Tapered Arches, 188

Dynamic Skin-Friction Effects on Buried Arches, 893

Equations of Curved Beams, 329

Lessons from Explosive Tests on RC Buried Arches, 833

Architecture

Beautiful Bridges, 1255

Bridge Design and the "Bridge Aesthetics Bibliography", 838

Arctic engineering

Cold Regions Engineering Research—Strategic Plan, 139

Composite Icewall Design and Analysis, 126

Arid lands

Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692

Selenium in Arid and Semi-arid Soils, 661

Simulating Effect of Channel Changes on Stream Infiltration, 649

Arizona

Dams Reborn, 1214

Deck Park Covers Phoenix Freeway, 1184

Armor units

Rubble-Mound Breakwaters with S-Shape Design, 1160

Sines Revisited, 1145

Army

Fired Up at Fort Drum, 1200

Strategic Defense Initiative Six Years Later in the Army, 30

Aromatic hydrocarbons

Biotransformation of Aromatics in Strip-Pit Pond, 185

Artificial intelligence

Expert Systems as Construction Management Tools, 745

Simulating Construction Robot Agents and Their Knowledge Environment, 121

Artificial recharge

Artificial Recharge of Ground Water, 1298

Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699

Asbestos

The Asbestos Agenda, 1266

ASCE Awards & Prizes

Award for an A-Frame, 1241

Top Projects for 1989, 1240

ASCE Awards and Prizes

Conceptual Construction Process Model, 18

Design Problems in Soil Liquefaction, 17

Differential Settlements in Steel Tanks, 2

Discussion of: Simple Model of Sediment - Laden Flows, 6

Does Ethical Engineering Practice Affect Creativity?, 4

Effect of External Pressure on Strength of Short Tubular Members, 9

Effects of Transverse Prestressing in Bridge Decks, 19

Field Verification of HELP Model for Landfills, 20

Geologic Characterization of Seismic Sources, Moving into the 1990s, 3

Geologic Prediction Model for Tunneling, 7

Mathematical Models of Cementation Processes, 16

Models of Sorptive Toxic Substances in Freshwater Systems. I: Basic Equations, 13

Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14

Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15

Response of Buried Cylinders to Surface Loads, 1

Sediment Entrainment and Deposition Measurements in Long Island Sound, 8

Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12

Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11

Spheroidal Cavity with Prescribed Asymmetric Tractions in Three-Dimensional Transverse Isotropy, 10

Uncertainties in Establishing Design Earthquakes, 5

ASCE Committees

ASCE 1987 Salary Survey, 239

ASCE Conferences

Building Moon Bases, 1176

ASCE Education

Summer Institutes for Minority High School Students, 236

ASCE Members

Status of Government Civil Engineers in America, 252

ASCE Outstanding Civil Engineering

Bullwinkle, 1234

Tapping A Glacier, 1235

ASCE Publications

Journal-Paper Review Procedure and Statistics, 461

ASCE Salaries and Fees

ASCE 1987 Salary Survey, 239

Ashes

Characterization of MSW Incinerator Ash, 167

Storing Sediment and Freeing Fish, 1258

Asphalt deterioration

From Guesswork to Guarantee?, 1264

Asphalts

Creative Application of Materials Engineering, 1313

Assessments

Entropy Model for Consistent Impact-Fee Assessment, 1063

Asymmetry

Analysis of Long Cantilever Cylindrical Shell

Subjected to Wind Loading, 393
Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956

Audits

Post-Audits of Environmental Programs and Projects, 1326

Australia

Geotechnical Input to a Major Bridge Project, 464

Automation

Affordable Housing: a Challenge to Civil Engineers, 1297

Automated Lay-Down Yard Control System—ALYC, 94

Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

Automation of Civil Engineers: Some Observations, 758

Computerized Decision Support Systems for Water Managers, 1311

Computerized Life-Cycle Cost Systems in the Army, 107

DYN² Method for Optimal Control of Water Flow in Open Channels, 728

Emulation for Control System Analysis in Automated Construction, 122

Excellence in the Constructed Project, 1317

Operations Management in Engineering Office, 767

Pipe Manipulator Enhancements for Increased Automation, 85

Prototype Robotics in Construction Industry, 77

The Race for Smart Cars, 1279

Simulating Construction Robot Agents and Their Knowledge Environment, 121

Stable Predictive Control of Open-Channel Flow, 710

University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341

Automobiles

Web-Crippling Strength of Cold-Formed Steel Beams, 936

Auto-regressive moving-average models

Modal Identification of Vibrating Structures Using ARMA Model, 402

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Awards

Award for an A-Frame, 1241

Tapping A Glacier, 1235

Top Projects for 1989, 1240

Axial compression

Elastic Stability of Cylindrical Shells with Weld Depressions, 860

Elastic Stability of Lap-Jointed Cylinders, 825

Axial forces

Dynamic Stability of Thin-Walled Structural Members Under Periodic Axial Torque, 266

Effect of External Pressure on Strength of Short Tubular Members, 9

Elastic Design Charts of Stiffened Coupled Structural Walls, 801

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Finite Element Model for RHS Double Chord K-Joints, 848

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Shear and Normal Stresses in Adhesive Joints, 415

Stability Functions for Three-Dimensional Beam-Columns, 813

Axial loads

Analytical Study for Concrete Confinement in Tied Columns, 954

Axial Dilution in Obstructed Round Buoyant Jet, 553

Cyclic Response of Concrete Bracing Members, 788

Design Interaction Equation for Steel Beam-Columns, 859

Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Reliability of Randomly Imperfect Beam-Columns, 403

Axial strain

Loading and Unloading Stress-Strain Curves for Brick Masonry, 944

Axisymmetry

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

Axisymmetric Vibrations of Reinforced Orthotropic Shallow Spherical Caps, 34

Circular Plate Analysis by Finite Differences: Energy Approach, 337

Error Estimation for Boundary Element Analysis, 386

Punching in R.C. Slabs, 890

Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297

Azimuth

Analytical Solution of Magnetic Declination Problem, 1004

Backwashing

Effect of Solids Property on Rates of Solids Dislodgment, 141

Backwater

Influence of Vessel Movements on Stability of Restricted Channels, 1153

Transitional Flow in Channel Junctions, 564

Bacteria

Economics of Selenium Removal from Drainage Water, 662

Effect of Pond Depth on Bacterial Mortality Rate, 198

Bank erosion

Evaluation of Navigation Dam Effects on Riverbanks, 1149

Lake Michigan Diversion and Illinois Waterways, 1140

Ohio River Bank Erosion—Traffic Effects, 1150

Sediment Transport Modeling, 1331

Universal Bank Erosion Coefficient for Meandering Rivers, 593

Bank stabilization

- Sediment Transport Modeling, 1331
- Simulating Effect of Channel Changes on Stream Infiltration, 649
- Width of Straight Alluvial Channels, 568

Barrier islands

- Barrier Islands: Process and Management, 1301
- Coastal Zone '89, 1304

Bars

- Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969
- Model of Finite Strain Creep of Metals, 353
- Reciprocal Conjugate Method for Space Curved Bars, 818
- Stability of Pretwisted Bars with Various End Torques, 304
- Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Base isolation

- Analytical Parameter Study for Class of Elastomeric Bearings, 930
- Comparative Study of Base Isolation Systems, 385
- Isolated Examples, 1284
- Sinusoidal Forced Vibration of Sliding Masonry System, 891
- Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803

Basins

- Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699

Bathymetry

- Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Bayesian analysis

- Measures of Structural Safety Under Imperfect States of Knowledge, 853
- Reliability Model for Soil Liners: Initial Design, 483
- Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

Bays

- Static Equilibrium Bays: New Relationships, 1142

Beach erosion

- Applications of Headland Control, 1143
- Sand Transport in Texas Tidal Inlet, 1152
- Twenty-first Coastal Engineering Conference, 1340

Beach nourishment

- Twenty-first Coastal Engineering Conference, 1340

Beaches

- Applications of Headland Control, 1143
- Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Beam columns

- Beam-Column Element on Weak Winkler Foundation, 374
- Beam-Column Moment Connections for Composite Frames: Part 1, 957
- Beam-Column Moment Connections for Composite Frames: Part 2, 958
- Design Interaction Equation for Steel Beam-

Columns, 859

- Design Interaction Equations for Steel Members, 885
- Interior Joints with Variable Anchorage Lengths, 921
- Load-Shortening Relationships for Bars, 889
- New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876
- Optimization of Imperfection-Sensitive Structures, 366
- Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824
- Reliability of Randomly Imperfect Beam-Columns, 403
- Stability Functions for Three-Dimensional Beam-Columns, 813

Beams

- The Church on Stilts, 1221
- Connections Between Precast Elements—Failure Within Connection Region, 976
- Continuum Models of Space Station Structures, 40
- Cyclic Tests of Full-Scale Composite Joint Subassemblages, 905
- Economical Analysis of Combined Dynamical Systems, 395
- Incremental Resistance and Deformations of Elastoplastic Beams, 861
- Lateral Buckling in Curtain Wall Systems, 934
- Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914
- Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404
- New Piers for an Old Bridge, 1190
- Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925
- Numerical Solution for Response of Beams With Moving Mass, 792
- Parametric Solution of Stresses in Beams, 287
- Predicting Deflections of Reinforced Concrete Beams Analytically, 855
- Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
- Quasi-Static Tests of Scaled Model Building, 900
- R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
- Residual Stresses in Beams with Yielding During Unloading, 829
- Role of Damping in Anomalous Response to Short Pulse Loading, 434
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Simplified Second-Order Elastic-Plastic Analysis of Frames, 104
- Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964
- Stiffened Coupled Shear Walls, 305
- Stochastic Finite Element Expansion for Random Media, 326
- Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334
- Torsional Stress Concentration in Thin-Walled Beams, 379
- Beams, cantilever**
- Measurement and Description of Tensile Fracture

in Granite, 382

Beams, structural

Elastic Design Charts of Stiffened Coupled Structural Walls, 801

Glitches in Flitch Beam Design, 1260

Web-Crippling Strength of Cold-Formed Steel Beams, 936

Beams, supports

Construction Effects on Bracing on Curved I-Girders, 915

Crack Control in Beams Using Deformed Wire Fabric, 945

Load-Shortening Relationships for Bars, 889

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Bearing capacity

Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950

Discrete Numerical Model for Soil Mechanics, 467

Glitches in Flitch Beam Design, 1260

Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520

Model Tests of Gravity Platforms: Interpretation, 534

Modification of Behavior of Double-Layer Grids: Overview, 847

Prestressed-Steel Continuous-Span Girders, 867

Skin Friction of Driven Piles in Calcareous Sands, 453

Upgrading Footings in Sand with Bored Piles, 546

Web-Crippling Strength of Cold-Formed Steel Beams, 936

Bearings

Analytical Parameter Study for Class of Elastomeric Bearings, 930

Design Method for Bridges on Lead-Rubber Bearings, 966

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803

Bed load

Bed-Surface Size Changes in Gravel-Bed Channel, 592

Effect of Sediment Density on Bed Load Transport, 556

Form Resistance in Gravel Channels with Mobile Beds, 570

Mobile-Bed Friction at High Shear Stress, 598

Model for Calculating Bed Load Transport of Sediment, 555

Sediment Entrainment in Channel with Rippled Bed, 569

Bed load movement

Model for Calculating Bed Load Transport of Sediment, 555

Bed material

Scour-Depth Prediction Under Armoring Conditions, 633

Bed movements

Form Resistance in Gravel Channels with Mobile Beds, 570

Bed ripples

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

Sediment Entrainment in Channel with Rippled Bed, 569

Bed roughness

Bed-Surface Size Changes in Gravel-Bed Channel, 592

Bedforms

Model for Calculating Bed Load Transport of Sediment, 555

Beds

Calculation of Bed Variation in Alluvial Channels, 572

Development and Design of Sludge Freezing Beds, 189

Bell footings

Bells Under Bells, 1295

Bench marks

GPS Satellite Surveys and Vertical Control, 1000

Bending

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Bending of Circular Plates Supported at Number of Points, 289

Effective Length Factor for Columns in Unbraced Frames, 794

Engineering Large Deflection Theory for Thick Plates, 320

Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Shear and Normal Stresses in Adhesive Joints, 415

Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334

Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387

Bending moments

Analytical Study of Prestressed Composite Beams, 927

Buckling of Three-Dimensional Rigid-Link Model, 271

Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Effect of External Pressure on Strength of Short Tubular Members, 9

Experimental Study of Prestressed Composite Beams, 926

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Shakedown of Grids Under Combined Bending and Torsion, 961

Benefit cost analysis

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

Floodplain-Management Plan Enumeration, 1101

Freeway Surveillance and Control System Using

SUBJECT INDEX

Border irrigation

- Simulation Model, 1043
- Hydropower Optimization via Sequential Quadratic Programming, 1117
- Information Systems and the Economics of Engineering Services, 737
- On-Site Incineration, 1212
- Post-Audits of Environmental Programs and Projects, 1326
- Practical Applications of Global Positioning System, 995
- Seepage and Contraction Joints in Concrete Canal Linings, 686
- Staging of Water Resource Developments, 438
- Benefits**
- Information Systems and the Economics of Engineering Services, 737
- Bentonite**
- Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186
- Berths**
- Water Jets Fight Silt, 1180
- Biaxial bending**
- Design Interaction Equation for Steel Beam-Columns, 859
- Biaxial loads**
- Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970
- Tapered Box Columns Under Biaxial Loading, 888
- Thin-Walled Steel Box Columns Under Biaxial Loading, 948
- Biaxial stress**
- Reliability Analysis of the Mohr Failure Criterion, 290
- Bibliographies**
- Bridge Design and the "Bridge Aesthetics Bibliography", 838
- Heat-Straightening of Steel: Fact and Fable, 952
- Bids**
- Productivity Database and Job Cost Control Using Microcomputers, 98
- Bifurcations**
- Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
- Binders, materials**
- Binders for Snow Roads and Runways in Antarctica, 131
- Binding**
- Residual Stresses in Beams with Yielding During Unloading, 829
- Biodegradation**
- Bioactive Adsorber Model for Industrial Wastewater Treatment, 217
- Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160
- Modeling of Enhanced Biodegradation in Unsaturated Soil Zone, 150
- Use of Geotextiles and Geocomposites in the United Kingdom, 75
- Biofilm**
- Dynamic Model of Nitrification in a Fluidized Bed, 195
- Effect of Concentration Boundary Layer on Carbon Limited Algal Biofilms, 159
- Inhibitory Substrate Utilization by Steady-State Biofilms, 158
- Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210
- Biological treatment**
- Biotransformation of Aromatics in Strip-Pit Pond, 185
- Biomass**
- Mitigation of Biological Process Upsets Caused by Organic Inhibitors, 204
- Biomechanics**
- Finite Element Modeling of Left Ventricle, 375
- Blistering**
- Blistering of Membranes Over Foam-Concrete Roofs, 771
- Blocks**
- Breakwater Choices, 1243
- Bluffs**
- Blockage Correction for Sharp-Edged Bluff Bodies, 360
- Boating**
- Ohio River Bank Erosion—Traffic Effects, 1150
- Bolts**
- Cyclic Behavior of Double Angle Connections, 852
- Cyclic Load Behavior of Bolted Timber Joint, 935
- Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Bond**
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843
- Bond issues**
- Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
- Bond stress**
- Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
- Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843
- Bonding**
- Interior Joints with Variable Anchorage Lengths, 921
- Bonding strength**
- Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
- Border irrigation**
- Analytical Model for Border Irrigation, 729
- Analytical Model of Level Basin Irrigation, 664
- Direct Land Grading Design of Irrigation Plane Surfaces, 680

Bored piles

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486

Upgrading Footings in Sand with Bored Piles, 546

Boundaries

Bounds on Response Variability of Stochastic Systems, 420

Contribution of Gaussian Curvature to Strain Energy of Plates, 350

Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387

Boundaries, property

General Direct Method for Land Subdivision, 1012

Boundary conditions

Boundary Conditions for Planar Granular Flows, 341

Bracing Loads of Columns with Varying Cross Sections, 303

Boundary element method

Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Bending of Circular Plates Supported at Number of Points, 289

Boundary Element Methods in Structural Analysis, 1302

Downdrag Forces in Group of Piles, 491

Error Estimation for Boundary Element Analysis, 386

Hydrodynamic Pressure on Gravity Dams Subjected to Ground Motions, 299

Influence Coefficients for Dynamic Response of Foundations, 417

Seismic Response of Strip Footings on Zoned Viscoclastic Soils, 319

Boundary layer

Bottom Boundary Layer Under Nonlinear Wave Motion, 1127

Effect of Concentration Boundary Layer on Carbon Limited Algal Biofilms, 159

Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146

Viscous Damping: Time Convolution of the Impulsive Solution, 652

Boundary layer flow

Simple Approach to Air and Water Drag on Sea Ice, 1154

Boundary shear

Mobile-Bed Friction at High Shear Stress, 598

Boundary value problems

Asymmetrical Buckling of Prestressed Tapered Arches, 388

A Crack Initiating from Rhombic Rigid Inclusion, 431

Stability of Pretwisted Bars with Various End Torques, 304

Box columns

Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970

Tapered Box Columns Under Biaxial Loading, 888

Thin-Walled Steel Box Columns Under Biaxial Loading, 948

Box girders

Box Segmentals: Refining Design, 1270

Deck Park Covers Phoenix Freeway, 1184

Braced excavation

Building Response to Excavation-Induced Settlement, 446

Internally Braced Cuts in Overconsolidated Soils, 474

Observed Performance of a Deep Excavation in Clay, 504

Tieback Supported Cuts in Overconsolidated Soils, 475

Bracing

Analysis of Multioutrigger-Braced Structures, 896

Brace Fractures and Analysis of Phase I Structure, 904

Construction Effects on Bracing on Curved I-Girders, 915

Earthquake Simulator Testing of Concentric Braced Dual System, 899

Effective Length Spectra for Cross Bracings, 972

In-Plane Vibrations of X-Braced Frames, 410

Lateral Buckling in Curtain Wall Systems, 934

Quasi-Static Tests of Scaled Model Building, 900

Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901

Seismic Performance of Steel Frames with Inverted V Braces, 907

Superskyscraper, 1201

Brackish water

Design of Dilution Junctions for Water-Quality Control, 1124

Braking

Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039

Brazil

Coastal Zone '89, 1304

Coastlines of Brazil, 1305

Energy from the Amazon, 1291

Breaking waves

Breaking Wave Forces on Vertical Walls, 1128

Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Breakwaters

Breaking Wave Forces on Vertical Walls, 1128

Breakwater Choices, 1243

Sines Revisited, 1145

Stability of Reef Breakwaters, 1138

Stem Waves Along Breakwater, 1163

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Wave Overtopping on Coastal Structures, 1139

Wave Transmission Over Submerged Breakwaters, 1165

Brick construction

Building Onto History, 1293

SUBJECT INDEX

Bridges, piers

Brick masonry

- Behavior of Brick Masonry Under Cyclic Compressive Loading, 872
- Brick Masonry: U.S. Office Building in Moscow, 43
- Building Response to Excavation-Induced Settlement, 446
- Loading and Unloading Stress-Strain Curves for Brick Masonry, 944
- Response of Masonry Bed Joints in Direct Shear, 922

Bridge abutments

- Estimation of the Inelastic Longitudinal Abutment Stiffness of Bridges, 928

Bridge construction

- Concrete Bridge Design and Construction in the United Kingdom, 100
- Construction Effects on Bracing on Curved I-Girders, 915
- Geotechnical Input to a Major Bridge Project, 464
- Selected Papers from Chinese Journals of Structural Engineering, 1333

Bridge deck

- From Guesswork to Guarantee?, 1264

Bridge decks

- Application of Robotics in Bridge Deck Fabrication, 62
- Concrete Degradation Due to Thermal Incompatibility of Its Components, 777
- Effects of Transverse Prestressing in Bridge Decks, 19
- Estimation of the Inelastic Longitudinal Abutment Stiffness of Bridges, 928
- Extreme Thermal Loadings in Highway Bridges, 887
- Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391
- Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933
- Rebuilding Roebling Delaware Aqueduct Bridge, 865

Bridge design

- Abutment Pile Design for Jointless Bridges, 960
- Beautiful Bridges, 1255
- Bridge Design and the "Bridge Aesthetics Bibliography", 838
- Calibration of Bridge-Strength Evaluation Code, 879
- Concrete Bridge Design and Construction in the United Kingdom, 100
- Design Method for Bridges on Lead-Rubber Bearings, 966
- Geotechnical Input to a Major Bridge Project, 464
- Guidelines for Flexural Design of Prestressed Composite Beams, 962
- HIBIC: Expert System for Highway Bridge Dynamics, 124
- Stochastic Stability of Bridges Considering Coupled Modes: II, 286

Bridge failure

- Calibration of Bridge-Strength Evaluation Code, 879

Bridge foundations

- Dynamic Response Verification of Simplified Bridge-Foundation Model, 460

Bridge inspection

- The Elusive Engineering Style, 257

Bridge loads

- Calibration of Bridge-Strength Evaluation Code, 879

Bridge maintenance

- From Guesswork to Guarantee?, 1264
- Guidelines for Flexural Design of Prestressed Composite Beams, 962
- Preventive Maintenance: Fixing What Ain't Broke, 1261

Bridges

- Analytical Parameter Study for Class of Elastomeric Bearings, 930
- Design Method for Bridges on Lead-Rubber Bearings, 966
- Preventive Maintenance: Fixing What Ain't Broke, 1261
- Rebuilding Roebling Delaware Aqueduct Bridge, 865
- Seismic Design of Bridges on Lead-Rubber Bearings, 965

Bridges, box girder

- Analysis of Continuous, Haunched Box-Girder Bridges by Finite Strips, 850
- Box Segmentals: Refining Design, 1270
- Bridge Retrofit Testing: Hinge Cable Restraints, 840
- Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404
- Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

Bridges, cable-stayed

- Expressway Centerpiece, 1194

Bridges, composite

- Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
- Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810

Bridges, concrete

- Concrete Bridge Design and Construction in the United Kingdom, 100
- Five-Spring Element for Biaxially Bent R/C Columns, 809
- Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Bridges, girder

- Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878
- Construction Effects on Bracing on Curved I-Girders, 915
- Prestressed-Steel Continuous-Span Girders, 867

Bridges, highway

- Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
- HIBIC: Expert System for Highway Bridge Dynamics, 124

Bridges, piers

- Durability of Posted and Epoxy-Grouted Timber

- Piles, 834
- New Piers for an Old Bridge, 1190
- Riprap Protection Without Filter Layers, 648
- Bridges, railroad**
- Fast Track, Instant Track, 1268
- Impact Load Distribution in Concrete Bridge Ties, 816
- Bridges, steel**
- Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878
- Elastic and Plastic Designs for Maximum Load, 866
- Heat-Straightening Prototype Damaged Bridge Girders, 884
- Bridges, suspension**
- Deer Isle Bridge: Efficacy of Stiffening Systems, 923
- Deer Isle Bridge: Field and Computed Vibrations, 924
- Rebuilding Roebling Delaware Aqueduct Bridge, 865
- Bridges, truss**
- Award for an A-Frame, 1241
- Bridges, wooden**
- Rebuilding Roebling Delaware Aqueduct Bridge, 865
- Brittle fractures**
- Ashland Tank Collapse Investigation, 51
- Brittle Fracture and Collapse of Large Grain-Storage Tank, 52
- Brittleness**
- Size Effects on Strength, Toughness and Ductility, 347
- Buckling**
- Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
- Analytical Parameter Study for Class of Elastomeric Bearings, 930
- Asymmetrical Buckling of Prestressed Tapered Arches, 388
- Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970
- Brace Fractures and Analysis of Phase I Structure, 904
- Buckling Analysis of Segmented Conical Concrete Shell Roof, 877
- Buckling and Postbuckling Analyses of Struts with Discrete Supports, 307
- Buckling Behavior of Pressure Loaded Cylindrical Panels, 283
- Buckling Loads of Columns with Varying Cross Sections, 303
- Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435
- Buckling of Three-Dimensional Rigid—Link Model, 271
- Buckling Strength of Partially Restrained I-Beams, 862
- Composite Action in Eccentrically Braced Frames, 909
- Compression Tests of Welded Channel Section Columns, 832
- Compressive Concrete Strain at Buckling of Lon-

- gitudinal Reinforcement, 808
- Construction Effects on Bracing on Curved I-Girders, 915
- Creep Buckling of Cylindrical Shell Under Variable Loading, 327
- Curved Beam Elements for Nonlinear Analysis, 314
- Cylindrical Buckling Load of Laminated Columns, 302
- Effect of Initial Imperfections on Dynamic Buckling of Shells, 328
- Elastic and Plastic Designs for Maximum Load, 866
- Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465
- Elastic Stability of Cylindrical Shells with Weld Depressions, 860
- Elastic Stability of Lap-Jointed Cylinders, 825
- Equations of Curved Beams, 329
- Exact or Lower Bound Tapered Column Buckling Loads, 851
- Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343
- Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
- Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419
- Lateral Buckling in Curtain Wall Systems, 934
- Lower Bounds for Eigenvalues via Rayleigh's Method, 346
- New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876
- Nondestructive Load Predictions of Concrete Shell Buckling, 857
- Optimization of Imperfection-Sensitive Structures, 366
- Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023
- Quasi-Static Tests of Scaled Model Building, 900
- Reliability of Randomly Imperfect Beam-Columns, 403
- Seismic Behavior of Concentrically Braced Frame, 897
- Seismic Performance of Steel Frames with Inverted V Braces, 907
- Stability of Antisymmetric Angle-Ply Laminated Plates, 321
- Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331
- Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424
- Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334
- Stress, Vibration and Buckling of Multilayered Cylinders, 789
- Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432
- Thin-Walled Steel Box Columns Under Biaxial Loading, 948
- Viscoelastic Stability of Columns on Continuous Support, 354
- Web-Crippling Strength of Cold-Formed Steel Beams, 936
- Building codes**
- Assessment of Seismic Structural Damage, 916
- Designing Structures for Snow Loads, 804

SUBJECT INDEX

Buses

Diatomaceous Soils: A New Approach, 1191
 Earthquake Simulator Testing of Concentric Braced Dual System, 899
 The Great Quake: On Site Reports, 1287
 Review of Standard Practice for Wind-Resistant Manufactured Housing, 27
 Strategies for Mitigating Damage to Metal Building Systems, 26
 Strategies for Wind Damage Mitigation-Summary, 36
 Two Roof Failures Due to Water Ponding and Related Code Requirements, 53
 Wind Damage to Masonry Buildings, 37
 Wind Design Problems with Building Structures During Construction, 29

Building design
 Antiplane Earthquake Waves in Long Structures, 428
 Assessment: U.S. Office Building in Moscow, 41
 High Tech on Campus, 1195
 Performance and Building: Problems of Evaluation, 58
 Seismic Waves in Buildings with Shear Walls Or Central Core, 427
 Selected Papers from Chinese Journals of Structural Engineering, 1333
 Strategies for Mitigating Damage to Metal Building Systems, 26
 Strategies for Wind Damage Mitigation-Summary, 36
 Transient Wind-Induced Internal Pressures, 355
 Wind Damage to Masonry Buildings, 37

Building, office
 Brick Masonry: U.S. Office Building in Moscow, 43

Buildings
 Antiplane Earthquake Waves in Long Structures, 428
 Building Response to Excavation-Induced Settlement, 446
 The Church on Stilts, 1221
 Control Systems of Building Structures by Active Cables, 959
 CSTRUCT: Computer Environment for Design of Steel Structures, 115
 Deterministic Model for Wind-Induced Oscillations of Buildings, 272
 Earthquake Load for Structural Reliability, 873
 In-Plane Vibrations of X-Braced Frames, 410
 Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836
 Mediation that Worked: Role of OSHA in L'Ambiance Plaza Settlement, 55
 Modeling Dynamic Occupant Loads, 875
 Moisture Accumulation in Insulated Walls in Cold Regions, 130
 P-Delta Analysis of Building Structures, 830
 Performance and Building: Problems of Evaluation, 58
 Seismic Behavior of Concentrically Braced Frame, 897
 Seismic Performance of Steel Frames with Inverted V Braces, 907
 Seismic Response of Imperial County Services

Building in 1979, 971
 Seismic Waves in Buildings with Shear Walls Or Central Core, 427
 Strategies for Wind Damage Mitigation-Summary, 36
 Transient Wind-Induced Internal Pressures, 355
 Wind Damage to Masonry Buildings, 37

Buildings, nonresidential
 Building Onto History, 1293
 Modeling Dynamic Occupant Loads, 875

Buildings, office
 Assessment: U.S. Office Building in Moscow, 41
 Bells Under Bells, 1295
 Orchestral Maneuvers, 1197
 Progressive Collapse: U.S. Office Building in Moscow, 44
 Structure: U.S. Office Building in Moscow, 42

Buildings, residential
 Problems of Housing in Kuwait, 1067

Buoyancy
 Density Measurement of Particle and Flocc Suspensions, 574
 Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575

Buoyant flow
 Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576

Buoyant jets
 Axial Dilution in Obstructed Round Buoyant Jet, 553
 Entrainment by Buoyant Jet Between Confined Walls, 578
 Note on Ayoub's Data of Horizontal Round Buoyant Jet in Current, 606

Buoys
 "Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279

Bureau of Reclamation
 Dams Reborn, 1214
 Implementation Strategies for Salinity Projects, 1114

Buried cables
 Thermal Instability in Buried Cable Backfills, 448

Buried pipes
 Analysis and Design of RPM and Other Composite Underground Pipelines, 1030
 Response of Buried Cylinders to Surface Loads, 1
 Seismic Risk Analysis of Buried Pipelines, 1031
 Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Buried structures
 Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465
 Loads on a Rigid Box Buried in a Nonlinear Medium, 1046

Buses
 Bus-Ride Panel Rating of Pavement Serviceability, 1027

Business administration

- Establishing, Operating, and Controlling an Engineering Consulting Firm, 235
- Method to Deal with DBE Issues, 248
- Road to Successful Sales—A Three-Step Process, 761

Cables

- Basic Problem on Optimal Spatial Cable Layout, 330
- Deer Isle Bridge: Efficacy of Stiffening Systems, 923
- Deer Isle Bridge: Field and Computed Vibrations, 924
- Design Analysis of Cable Networks, 973
- Effect of Length on Fatigue Life of Long Thin Continuous Components, 351
- Fabric Meets Cable, 1188
- Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134

Caissons

- Foundation Engineering: Current Principles and Practices, 1318

Calcareous sands

- Skin Friction of Driven Piles in Calcareous Sands, 453

Calcareous soils

- Cyclic Axial Loading Analysis of Piles in Sand, 493

Calibration

- Accuracy of Estimated Reference Crop Evapotranspiration, 730
- Calibration of Bridge-Strength Evaluation Code, 879
- Implicit Network Calibration, 1087

California

- Agricultural Drainage Water—How Should it be Regulated in California?, 657
- Augering Answers, 1289
- The Great Quake: On Site Reports, 1287
- Isolated Examples, 1284
- Network Flow Algorithm Applied to California Aqueduct Simulation, 1080

Cameras

- GPS-Guided Vision Systems for Real-Time Surveying, 998

Canal design

- Panama Canal: Its Past and Its Future, 249

Canal linings

- Seepage and Contraction Joints in Concrete Canal Linings, 686

Canals

- Control of Irrigation Canal Networks, 665
- LP Operation Model for On-Demand Canal Systems, 709

Cantilevers

- Impact of Earthquakes on Cantilever Retaining Walls, 939
- The Jet Set, 1283

Canyons

- Diffraction of SV Waves by Circular Canyons of Various Depths, 389

Capacity

- A Capacity Expansion Model for Hydrothermal Power Systems, 1082
- Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878
- Influential Mode of Imperfection on Carrying Capacity of Structures, 397
- Methodology for Optimal Design of a Parking Lot, 1025
- Optimization Models for Wastewater Reuse in Irrigation, 673
- Truck Capacity Selection for Earthmoving, 72

Capital

- Buying Tomorrow's Water, 1216

Capital improvements

- Infrastructure Maintenance Management System Development, 258

Carbon monoxide

- Biological Denitrification of Water, 196
- CO Modeling in Alaska, 140

Careers

- Finding Qualified People in a Tight Labor Market, 748

Case reports

- Artificial Recharge of Ground Water, 1298
- Breakwater Choices, 1243
- Building the Perfect Playpen, 1281
- Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194
- Grouting Trends, 1274
- High-Rise Embankments, 1267
- Impact of Material Management on Productivity—A Case Study, 82
- Multicriterion Analysis of Hydropower Operation, 445
- Necessary Redundancy in Geotechnical Engineering, 532
- Observed Performance of a Deep Excavation in Clay, 504
- Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753
- Post-Audits of Environmental Programs and Projects, 1326
- Productivity Database and Job Cost Control Using Microcomputers, 98
- Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054
- Twenty-first Coastal Engineering Conference, 1340
- Urban Groundwater Rise Control: Case Study, 702

Catchments

- Time of Concentration Formula for Pervious Catchments, 713

Catenaries

- Arch in Soil Arching, 469
- Hydraulics of Catenary Irrigation Trail Tubes, 669

Cathodic protection

- Parking Garage Crisis, 1262

Cavitation

- Cavitation Erosion in Hydroturbines, 626

Cavities

SUBJECT INDEX

Chimneys

Spheroidal Cavity with Prescribed Asymmetric Tractions in Three-Dimensional Transverse Isotropy, 10

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297

Cavity expansion

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Cellular structures

Evaluation of New Concepts for Cellular Structure Construction, 61

Cement

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Cement grouts

Injection of Fine Sands with Very Fine Cement Grout, 545

Stabilizing a 'Mann'-Sized Sinkhole, 1290

Cement paste

Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268

Effect of Early Freezing on Permeability of Cement Paste, 778

Strength and Porosity of Portland Cement Paste Subjected to Chloride Penetration, 769

Cementation

Cementation Effects in Frictional Materials, 523

Influence of Cementation on Liquefaction of Sands, 507

Mathematical Models of Cementation Processes, 16

Cements

Effect of Early Freezing on Permeability of Cement Paste, 778

Fold and Bond Construction of Cement Laminate Structural Shapes, 779

Injection of Fine Sands with Very Fine Cement Grout, 545

Properties of Solid Waste Incinerator Fly Ash, 508

Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Simple Groundwater Laboratory Models, 597

Center-pivot irrigation

Optimal Scheduling of Irrigation Machines: I
—Model Development, 723

Optimal Scheduling of Irrigation Machines: II
—Applications and Results, 724

Center-point irrigation

Center-Pivot End Gun Irrigation Cost Analysis, 722

Centrifuge

Centrifuge Study of Faulting Effects on Tunnel, 499

Centrifuge model

Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540

Modeling Solute Transport by Centrifugation, 171

Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503

Channel beds

Experimental Investigation of Shallow Recirculating Flows, 602

Guide for Estimating Riverbed Degradation, 571

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Channel bends

Dam-Break Flows in Curved Channel, 637

Modeling of Unsteady Flow in Curved Channel, 638

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Channel design

Width of Straight Alluvial Channels, 568

Channel erosion

Riprap Design, 604

Channel flow

Experiments in Side-Channel Spillways, 587

Hydraulic Engineering, 1322

Influence of Vessel Movements on Stability of Restricted Channels, 1153

Secondary Flow in Mildly Sinuous Channel, 567

Universal Bank Erosion Coefficient for Meandering Rivers, 593

Channels

Experiments in Side-Channel Spillways, 587

Channels, waterways

Analytic Solutions for Tidal Model Testing, 655

Channel Tunnel, Texas Style, 1286

Collision Tolerant Pile Structure Hinge Concepts, 1132

Influence of Vessel Movements on Stability of Restricted Channels, 1153

Mass Conservation: 1-D Open-Channel Flow Equations, 565

Modeling of Unsteady Flow in Curved Channel, 638

Riprap Design, 604

Simulating Effect of Channel Changes on Stream Infiltration, 649

Sloping Crest Crump Weir, 676

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Supercritical Flow in Channel Junctions, 586

Thermally Induced Density Currents in Nonrectangular Sidearms, 628

Turbulent Surface Jet in Channel of Limited Depth, 646

Unification of Muskingum Difference Schemes, 582

Characteristics

Characterization of MSW Incinerator Ash, 167

Models of Dam-Break Flow in R-T Space, 584

Chemical grouting

Stabilizing a 'Mann'-Sized Sinkhole, 1290

Chicago

Bells Under Bells, 1295

Chimneys

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Wind Induced Vibration of Two Flexible Cylindrical Structures, 392

China, People's Republic of

PC-Based Data Acquisition System for Structural Monitoring, 123

Selected Papers from Chinese Journals of Structural Engineering, 1333

Tests of Jet Pump Operating under Head of 300 M, 441

Time Series Analysis of Water Quality Data in Pearl River, China, 176

Water Resources Management in North China Plain, 1109

Chlorides

Concrete Degradation Due to Thermal Incompatibility of Its Components, 777

Modeling Sodium and Chloride in Surface Streams During Base Flows, 177

Modeling Solute Transport by Centrifugation, 171
Strength and Porosity of Portland Cement Paste Subjected to Chloride Penetration, 769

Chlorinated hydrocarbon pesticides

PCE Volatilized from Stagnant Water and Soil, 215

Chromates

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Circulation

Thermally Induced Density Currents in Nonrectangular Sidearms, 628

Civil engineering

Actions Necessary to Make Civil Engineering More Attractive to High-Quality High School Students, 237

Civil Engineering Design Professors Should be Registered Engineers, 240

Computing in Civil Engineering: Computers in Engineering Practice, 1312

Does Civil Engineering Need System Engineering?, 227

First, Second, and Third Thoughts on Civil Engineering Education, 231

Future of Civil Engineering Profession and Role of Education, 229

Global Changes and New Challenges for Civil Engineers, 226

Negotiating and Drafting the Civil Engineering Contract, 756

New Frontiers in Civil Engineering: Infrastructure, 254

Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072

Screaming Structures, 1277

Solving Low Enrollment Problems in Civil Engineering, 242

Civil engineers

ASCE 1987 Salary Survey, 239

Beautiful Bridges, 1255

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Cincinnati's Dream Team, 1236

Hydrogeology Comes to the Surface, 1210

Solving Low Enrollment Problems in Civil Engineering, 242

neering, 242

Status of Government Civil Engineers in America, 252

Technology and the Constitution, 238

Claims

A Better Way, 1292

Excellence in the Constructed Project, 1317

Clay liners

Hydraulic Conductivity of Three Landfill Clay Liners, 510

Clay soils

Experimental p - y Model for Submerged Stiff Clay, 451

In Situ Hydraulic Conductivity Tests for Compacted Clay, 512

Investigation of Crushed Rock Filters for Dam Embankment, 468

New Basis for Earthwork Specification for Clay Soil, 537

Stability Analysis of Embankments on Soft Ground, 458

Clays

Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481

Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540

Consolidation of Sensitive Clay as Phase Change Process, 527

Critical Filters for Impervious Soils, 498

Cyclic Behavior of Clays in Undrained Simple Shear, 482

Differential Settlements in Steel Tanks, 2

Fissure Parameters in Stiff Clays Under Compression, 518

Lateral Wall Deflections of Braced Excavations in Clay, 494

Model Tests of Gravity Platforms: Description, 533

Model Tests of Gravity Platforms: Interpretation, 534

Observed Performance of a Deep Excavation in Clay, 504

Permeability of Clays Under Organic Permeants, 452

Saturated Clay Response During Braced Cut Construction, 505

Sensitive Strata in Bootlegger Cove Formation, 514

Strain Increment and Stress Directions in Torsion Shear Tests, 524

Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186

Client relationships

Impact Analysis of Owner-Directed Acceleration, 68

Climatic changes

Accuracy of Estimated Reference Crop Evapotranspiration, 730

Climatology

Global Changes and New Challenges for Civil Engineers, 226

The History of Frost Research in Minnesota, 134

SUBJECT INDEX

Cold regions

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Simulation Models of Sequences of Dry and Wet Days, 684

Clogging

Effect of Envelopes on Flow Pattern Near Drain Pipe, 704

Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699

Improvements in Soil Absorption Trench Design, 193

Closed form solutions

Axisymmetric Vibrations of Reinforced Orthotropic Shallow Spherical Caps, 34

A Crack Initiating from Rhombic Rigid Inclusion, 431

Equivalent Systems for Variable Thickness Plates, 405

Stiffened Coupled Shear Walls, 305

Cnoidal waves

Stem Waves Along Breakwater, 1163

Coagulation

Membrane Filtration of Coagulated Suspensions, 142

Coal gasification

Coal Gas Legacy, 1213

Coal mines

High Hopes for Cattails, 1215

Coal tar

Coal Gas Legacy, 1213

Coastal engineering

Analytic Solutions for Tidal Model Testing, 655

Barrier Islands: Process and Management, 1301

Coastal Zone '89, 1304

Coastlines of Brazil, 1305

Coastlines of Italy, 1306

Coastlines of the World, 1307

Cold Regions Engineering Research—Strategic Plan, 139

Complex Envelope of Surface Gravity Waves, 1166

Maximum Periodic Wave Run-up on Smooth Slopes, 1167

Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Performance of a Wedge-Type Absorbing Wave Maker, 1125

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Sand Transport in Texas Tidal Inlet, 1152

Twenty-first Coastal Engineering Conference, 1340

Wave Overtopping on Coastal Structures, 1139

Coastal environment

Barrier Islands: Process and Management, 1301

Coastal Zone '89, 1304

Coastlines of Brazil, 1305

Coastlines of Italy, 1306

Coastlines of the World, 1307

Cohesive Sediment Transport Part II: Application, 615

Twenty-first Coastal Engineering Conference, 1340

Coastal management

Applications of Headland Control, 1143

Barrier Islands: Process and Management, 1301

Coastal Zone '89, 1304

Coastlines of Brazil, 1305

Coastlines of Italy, 1306

Coastlines of the World, 1307

Coastal plains

Irrigated Agriculture and Water Quality in the East, 719

Coastal processes

Twenty-first Coastal Engineering Conference, 1340

Coastal structures

Maximum Periodic Wave Run-up on Smooth

Slopes, 1167

Twenty-first Coastal Engineering Conference, 1340

Wave Overtopping on Coastal Structures, 1139

Codes

Cracking the Fire Code, 1218

Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Seismic Codes: Preparing for the Unknown, 1285

Coefficient

Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156

Coefficients

Analysis of Inactivation of *Giardia Lamblia* by Chlorine, 146

Blockage Correction for Sharp-Edged Bluff Bodies, 360

Influence Coefficients for Dynamic Response of Foundations, 417

Predicting Deflections of Reinforced Concrete Beams Analytically, 855

Prestressed-Steel Continuous-Span Girders, 867

Soil-Sheet Pile Interaction in Vibro-Piling, 506

Unification of Muskingum Difference Schemes, 582

Cofferdams

Evaluation of New Concepts for Cellular Structure Construction, 61

Cohesionless soils

Filtration of Broadly Graded Cohesionless Soils, 547

Cohesive sediment

Cohesive Sediment Transport Part I: Process Description, 614

Cohesive Sediment Transport Part II: Application, 615

Cohesive soils

ID Strain in Normally Consolidated Cohesive Soils, 485

Density Tests Above Zero Air Voids Line, 502

Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520

Cold regions

Binders for Snow Roads and Runways in Antarctica, 131

Cold Regions Engineering, 1308

Cold Regions Environmental Engineering: Tomorrow's Challenges, 135

Designing Structures for Snow Loads, 804

Geothermal Energy Applications in Wastewater Treatment, 129

The History of Frost Research in Minnesota, 134

Moisture Accumulation in Insulated Walls in Cold Regions, 130

Strength Characteristics of Frozen Fox Gravel, 132

Cold weather construction

Binders for Snow Roads and Runways in Antarctica, 131

Cold Regions Engineering, 1308

Cold Regions Engineering Research—Strategic Plan, 139

Strength Characteristics of Frozen Fox Gravel, 132

Tapping A Glacier, 1235

Cold weather operations

Cold Regions Engineering, 1308

Cold-formed steel

Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422

Collapse

Ashland Tank Collapse Investigation, 51

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59

Collapse of Compacted Clayey Sand, 515

Mediation that Worked: Role of OSHA in L'Ambiance Plaza Settlement, 55

Quick Response on the Mississippi, 1256

Collapse load

Analysis of R/C Panels Using Different Concrete Models, 298

Collapsible soils

Foundation Engineering: Current Principles and Practices, 1318

Collective bargaining

Project-Labor Agreements in Construction Industry, 97

Collisions

Collision Tolerant Pile Structure Hinge Concepts, 1132

General Aviation Collision-Avoidance Alternatives, 1047

Colorado

Network Models of Water Rights and System Operations, 1115

Colorado River

Implementation Strategies for Salinity Projects, 1114

Columns

Buckling Loads of Columns with Varying Cross Sections, 303

Compression Tests of Welded Channel Section Columns, 832

Connections Between Precast Elements—Failure Within Connection Region, 976

Cyclic Tests of Full-Scale Composite Joint Sub-assemblies, 905

Effective Length Factor for Columns in Unbraced Frames, 794

Exact or Lower Bound Tapered Column Buckling Loads, 851

Five-Spring Element for Biaxially Bent R/C Columns, 809

Hysteretic Column Under Earthquake Excitations, 264

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Quasi-Static Tests of Scaled Model Building, 900

Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Seismic Response of Imperial County Services Building in 1979, 971

Simplified Second-Order Elastic-Plastic Analysis of Frames, 104

Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964

Treatment of Manganese from Mining Seep Using Packed Columns, 163

Viscoelastic Stability of Columns on Continuous Support, 354

Columns, supports

Analytical Study for Concrete Confinement in Tied Columns, 954

Combined stress

Combined Stress Behavior of Structural Glazing Joints, 858

Communication

Improving Management of Technology, 760

Road to Successful Sales—A Three-Step Process, 761

Communication skills

Ensuring Your Project Managers' 'Buy-In' to Your Project Management System, 736

Messages: Clear and Effective, 749

Training Expatriate Engineering Professionals, 755

Communications skills

Communications Failure in Hyatt Regency Disaster, 245

Community relations

Does Ethical Engineering Practice Affect Creativity?, 4

Property-Value Guarantees for Waste Facilities, 1068

Community support

Property-Value Guarantees for Waste Facilities, 1068

Compacted soils

Building a Better Landfill Liner, 1209

Cementation Effects in Frictional Materials, 523

Collapse of Compacted Clayey Sand, 515

In Situ Hydraulic Conductivity Tests for Compacted Clay, 512

New Basis for Earthwork Specification for Clay Soil, 537

Surficial Stability of Compacted Clay Slopes, 478

Compaction

- Collapse of Compacted Clayey Sand, 515
- Construction and Performance of Two Large Rockfill Embankments, 544
- Density Tests Above Zero Air Voids Line, 502
- Properties of Solid Waste Incinerator Fly Ash, 508
- Relative Compaction of Fill Having Oversize Particles, 530

Comparative studies

- Breakwater Choices, 1243
- Comparison: US P-61 and Delft Sediment Samplers, 654
- Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136

Compatibility

- The Effect of Compatibility and Prestressing on Optimized Trusses, 828

Compensation

- Fee Vs. Quality, 230

Competition

- Improving Management of Technology, 760
- Managing Change in the Midst of Economic Uncertainty, 750
- Technology and Strategic Management in Construction, 740
- Training Expatriate Engineering Professionals, 755

Compliance

- Stress-Path-Dependent Correction for Membrane Penetration, 549

Composite beams

- Analytical Study of Prestressed Composite Beams, 927
- Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
- Behaviors of Steel and Composite Beams at Various Displacement Rates, 910
- Buckling Strength of Partially Restrained I-Beams, 862
- Composite Action in Eccentrically Braced Frames, 909
- Experimental Study of Prestressed Composite Beams, 926
- Glitches in Flitch Beam Design, 1260
- Guidelines for Flexural Design of Prestressed Composite Beams, 962
- Shear Connector Design for Composite Flexural Members, 814
- Splitting Induced by Shear Connectors in Composite Beams, 806
- Steel-Reinforced Glued Laminated Timber, 811

Composite columns

- Cylindrical Buckling Load of Laminated Columns, 302

Composite materials

- Analysis and Design of RPM and Other Composite Underground Pipelines, 1030
- Binders for Snow Roads and Runways in Antarctica, 131
- Large Deflections of Orthotropic Plates Under Pressure, 423
- Model for Response of Concrete To Random

Compressive Loads, 953

- A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338
- Setting Stresses in Polymer Composites with Multiple-Size Particles, 784
- Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334

Composite structures

- Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
- Axisymmetric Vibrations of Reinforced Orthotropic Shallow Spherical Caps, 34
- Beam-Column Moment Connections for Composite Frames: Part 1, 957
- Beam-Column Moment Connections for Composite Frames: Part 2, 958
- Bells Under Bells, 1295
- Composite Icewall Design and Analysis, 126
- Connections Between Precast Elements—Failure Outside Connection Region, 805
- Cylindrical Buckling Load of Laminated Columns, 302
- Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950
- Fatigue Behavior of Composite Metal Deck Slabs, 790
- Haunches and Hangers, 1199
- Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933
- Pre-Tensioned and Posttensioned Composite Girders, 974
- Rubble-Mound Breakwaters with S-Shape Design, 1160
- Stability of Antisymmetric Angle-Ply Laminated Plates, 321
- Stress, Vibration and Buckling of Multilayered Cylinders, 789
- Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Compressed air

- Electricity From Air, 1239

Compressibility

- Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416
- Mechanical Model for Oscillating Water Column with Compressibility, 377

Compression

- Dynamic Triaxial Tests of High-Strength Concrete, 317
- Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843

Compression tests

- Cementation Effects in Frictional Materials, 523

Compression waves

- Dynamics of Saturated Rocks. II: Body Waves, 324

Compressive strength

Cementation Effects in Frictional Materials, 523
Fissure Parameters in Stiff Clays Under Compression, 518

Injection of Fine Sands with Very Fine Cement Grout, 545

Strength Characteristics of Frozen Fox Gravel, 132

Computation

Complex Envelope of Surface Gravity Waves, 1166

Discrete Numerical Model for Soil Mechanics, 467

Evaluation of Deep Pumping Tests, 484

Finite Strip-Elements for Thick Plate Analysis, 335

Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618

Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Model Tests of Gravity Platforms: Interpretation, 534

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Computer aided drafting (CAD)

Automating Design of Boston's Artery, 1229

Bullwinkle, 1234

CAD Speeds Viaduct Replacement, 1252

The CADD Landfill, 1227

CSTRUCT: Computer Environment for Design of Steel Structures, 115

Facilities Management With CADD, 1232

Linking Civil Engineering Design and Drafting Software via IGES, 116

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341

Computer aided instruction

Improving Water Delivery System Operation Using Training Simulators, 1110

University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341

Computer analysis

Computerized Life-Cycle Cost Systems in the Army, 107

Large Deflections of Orthotropic Plates Under Pressure, 423

Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136

Rainfall Intervention Analysis for On-Line Applications, 1096

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Simplified Second-Order Elastic-Plastic Analysis of Frames, 104

Computer applications

Application of Graph Theory to Computer-Assisted Mapping, 1010

Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938

CAD Speeds Viaduct Replacement, 1252

Computer Utilization in Structural Engineering, 1310

Computer-Aided Design for Horizontal Alignment, 1042

Computerized Decision Support Systems for Water

Managers, 1311

Computing in Civil Engineering: Computers in Engineering Practice, 1312

Design of Efficient Side-Channel Spillway, 624

Developments of Geographic Information Systems Technology, 1003

Discrete Numerical Model for Soil Mechanics, 467

Emulation for Control System Analysis in Automated Construction, 122

Evaluation of Subsurface Exploration Programs, 80

Finite Element Modeling of Left Ventricle, 375

Improving Water Delivery System Operation Using Training Simulators, 1110

Mathematical Modeling of Fluvial Sand Delivery, 1144

Measurement of Work Progress: Quantitative Technique, 89

Microcomputer Applications in Simulated CE Project, 757

Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640

Network Models of Water Rights and System Operations, 1115

Productivity Database and Job Cost Control Using Microcomputers, 98

The Race for Smart Cars, 1279

Seismic Analysis of Multistory Building Systems Using Microcomputers, 101

Time-Cost Trade-off Among Related Activities, 90

Computer graphics

Computer Graphics in Truss-Model Design Approach, 120

Computer hardware

Automation of Civil Engineers: Some Observations, 758

Computing in Civil Engineering: Computers in Engineering Practice, 1312

Developments of Geographic Information Systems Technology, 1003

Computer model

Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117

Computer models

Analytic Solutions for Tidal Model Testing, 655

Analytical Evaluation of K-Braced Structure Seismic Test, 902

Applying Groundwater Flow Models in Vapor Extraction System Design, 149

A Capacity Expansion Model for Hydrothermal Power Systems, 1082

CO Modeling in Alaska, 140

Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154

Computerized Decision Support Systems for Water Managers, 1311

Detention Pond Sizing for Multiple Return Periods, 589

Evaluation of Deep Pumping Tests, 484

Groundwater Table Simulation Under Different Rice Irrigation Practices, 697

Impact of Land Use and NPS Loads on Lake Quality, 179

Load-Distribution Model for Light-Frame Wood

SUBJECT INDEX

Computerized simulation

Roof Assemblies, 942
LP Operation Model for On-Demand Canal Systems, 709
The Model Cleanup, 1219
Modeling Phosphorus Transport in Grass Buffer Strips, 165
Nonisothermal Consolidation in Unsaturated Soil, 522
Selection of Stormwater Model Parameters, 153
Simulation of Nonsteady Construction Processes, 69
Spillway Discharge Calculations in NWS DAMBRK, 607
Computer programming
Is Advanced Technology "The Gateway to Irresponsibility?", 259
Multi-Objective Programming Approach for Routing Hazardous Materials, 1058
Computer programs
Analytical Evaluation of K-Braced Structure Seismic Test, 902
Automating Design of Boston's Artery, 1229
Boundary Element Methods in Structural Analysis, 1302
Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540
Computer Graphics in Truss-Model Design Approach, 120
Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100
Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91
General Direct Method for Land Subdivision, 1012
Impact of Earthquakes on Cantilever Retaining Walls, 939
Improved Approach to Irrigation Scheduling Programs, 701
Load Redistribution in Frame with Settling Footings, 106
LP Operation Model for On-Demand Canal Systems, 709
Optimal Scheduling of Irrigation Machines: I—Model Development, 723
The Program Manager: Mind Over Machine, 1224
Spillway Discharge Calculations in NWS DAMBRK, 607
Storm Drain Design: Diffusive Flood Routing for PCs, 617
Urban Groundwater Rise Control: Case Study, 702
Use of STABL Program in Tied-back Wall Design, 476
Validity of Smith Model in Pile Driving Analysis, 517
Computer software
Automation of Civil Engineers: Some Observations, 758
Computing in Civil Engineering: Computers in Engineering Practice, 1312
Design of Efficient Side-Channel Spillway, 624
Developments of Geographic Information Systems Technology, 1003
GPS Geodesy and Kinematic Topography Measurements and Results, 991

Guide for Evaluating Engineering Software, 1320
Integrated Processing of GPS and Gravity Data, 979
Interactive Design Optimization of Framed Structures, 105
Is Advanced Technology "The Gateway to Irresponsibility?", 259
Linking Civil Engineering Design and Drafting Software via IGES, 116
Managing a Megaproject, 1225
Microcomputer-Aided Analysis and Design of Steel Frames, 109
Shopping for Better Project Management, 1175
Simulating Construction Robot Agents and Their Knowledge Environment, 121
Storm Drain Design: Diffusive Flood Routing for PCs, 617
Surveying With Motorola Eagle GPS Receiver, 999
Verifying Software by Use, 1223
Computer systems programs
Developing a Data Base for Use in Groundwater Management, 1077
Computer traffic control
Commuter Control, 1185
The Race for Smart Cars, 1279
Computerization
Automatic Generation of Seepage Flow Nets by Finite Element Method, 119
Automation of Civil Engineers: Some Observations, 758
Computer Utilization in Structural Engineering, 1310
Microcomputers: Investing in the Future, 1231
University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341
Computerized control systems
Design of Dilution Junctions for Water-Quality Control, 1124
Emulation for Control System Analysis in Automated Construction, 122
Experimental Digital Control of Structures, 339
Computerized design
Automated Design of Wastewater Plants, 1228
Automated Lay-Down Yard Control System—ALYC, 94
Automating Design of Boston's Artery, 1229
Building the Perfect Playpen, 1281
The CADD Landfill, 1227
Computer-Integration: Reducing Fragmentation in AEC Industry, 102
Least-Weight Design of Steel Frameworks Accounting for P- Δ Effects, 874
PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005
Shape Optimal Design of Arch Dam, 929
Computerized simulation
Chaotic Behavior of Particle on Vibrating Plate, 352
Design of Dilution Junctions for Water-Quality Control, 1124
Floodplain-Management Plan Enumeration, 1101
Groundwater Table Simulation Under Different

- Rice Irrigation Practices, 697
- Interactive Graphing of Simulation Networks, 112
- Microcomputer Model for Oil Spill Simulation (MICROSS), 103
- Numerical Approach for Generating Beta Random Variables, 113
- Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
- Simulation of Cracking in Large Arch Dam: Part II, 883
- Simulation of Nonsteady Construction Processes, 69
- Use of Binary Choice Decision Process for Adaptive Signal Control, 1033

Computerized test methods

- Pseudodynamic Test Method—Current Status and Future Directions, 913

Computers

- Computer-Integration: Reducing Fragmentation in AEC Industry, 102
- Computing in Civil Engineering: Computers in Engineering Practice, 1312
- Is Advanced Technology "The Gateway to Irresponsibility?", 259
- Microcomputers: Investing in the Future, 1231
- Unified Activity Network Model, 114

Concentrated loads

- Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Concentration time

- Time of Concentration Formula for Pervious Catchments, 713
- Toward a New Rational Method, 622

Concrete

- Analytical Model for Shear Slip of Cracked Concrete, 831
- Analytical Study for Concrete Confinement in Tied Columns, 954
- Analytical Study of Prestressed Composite Beams, 927
- Analytical Study on Deformation of Fresh Concrete, 293
- Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Blistering of Membranes Over Foam-Concrete Roofs, 771
- Bridge Retrofit Testing: Hinge Cable Restraints, 840
- Concrete Degradation Due to Thermal Incompatibility of Its Components, 777
- Constitutive Equations for Concrete in Failure State, 362
- Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783
- Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63
- Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268
- Continuum Damage Theory—Application to Concrete, 284
- Creative Application of Materials Engineering, 1313

- Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772
- Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768

- Dynamic Triaxial Tests of High-Strength Concrete, 317

- Experimental Study of Prestressed Composite Beams, 926

- Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371

- Extreme Thermal Loadings in Highway Bridges, 887

- FEM Dynamic Fracture Analysis of Concrete Beams, 396

- Formwork Pressures in Tall and Thick Concrete Walls, 88

- Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336

- Fracture Mechanics Analysis of High-Strength Concrete, 782

- Guidelines for Flexural Design of Prestressed Composite Beams, 962

- A Hard Look at Concrete, 1178

- Marine Curing of Steel Fiber Composites, 775

- Measurement of Characteristic Length of Nonlocal Continuum, 309

- Mode I Fracture in Concrete Using Center-Cracked Plate Specimens, 285

- Model for Response of Concrete To Random Compressive Loads, 953

- Nonlinear Seismic Analysis of Arch Dams, 310

- Pre-Tensioned and Posttensioned Composite Girders, 974

- Seepage and Contraction Joints in Concrete Canal Linings, 686

- Segmental Tunnel Lining Meets 'Buy American', 1269

- Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486

- Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487

- Simulation of Cracking in Large Arch Dam: Part I, 882

- Simulation of Cracking in Large Arch Dam: Part II, 883

- Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384

- Solidification Theory for Concrete Creep—I. Formulation, 368

- Structural Materials, 1336

- Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

- Uniaxial Behavior of Concrete in Cyclic Tension, 795

Concrete blocks

- Inelastic Behavior of Concrete Masonry Shear Walls, 918

Concrete construction

- Formwork Pressures in Tall and Thick Concrete Walls, 88

Concrete Creep

- Solidification Theory for Concrete Creep II. Verification and Application, 369

SUBJECT INDEX

Concrete, reinforced

Concrete deterioration

Freeze-Thaw Deterioration of Concrete Pavements, 776

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Concrete durability

Analysis of R/C Panels Using Different Concrete Models, 298

Freeze-Thaw Deterioration of Concrete Pavements, 776

Concrete, lightweight

Sludge Ash as Lightweight Concrete Material, 144

Concrete masonry

Inelastic Behavior of Concrete Masonry Shear Walls, 918

Concrete pavements

Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038

Failure of Concrete Pavements in Test Tracks, 1048

Freeze-Thaw Deterioration of Concrete Pavements, 776

Pumping Prediction Model for Highway Concrete Pavements, 1026

Concrete piles

Skin Friction of Driven Piles in Calcareous Sands, 453

Concrete pipes

Creative Application of Materials Engineering, 1313

Concrete, post-tensioned

Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938

The Church on Stilts, 1221

Connections Between Precast Elements—Failure Outside Connection Region, 805

Post-Tensioned Transportation, 1272

Concrete, precast

Box Segmentals: Refining Design, 1270

Concrete Bridge Design and Construction in the United Kingdom, 100

Concrete Lunar Base Investigation, 22

Connections Between Precast Elements—Failure Within Connection Region, 976

High Tech on Campus, 1195

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Progressive Collapse: U.S. Office Building in Moscow, 44

Concrete, prestressed

Behavior of Concrete Structures in Service, 787

Concrete Bridge Design and Construction in the United Kingdom, 100

Concrete Lunar Base Investigation, 22

Connections Between Precast Elements—Failure Outside Connection Region, 805

Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Impact Load Distribution in Concrete Bridge Ties, 816

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

Concrete properties

Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371

A Hard Look at Concrete, 1178

Concrete, reinforced

Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823

Analysis of R/C Panels Using Different Concrete Models, 298

Beam-Column Moment Connections for Composite Frames: Part 1, 957

Beam-Column Moment Connections for Composite Frames: Part 2, 958

Behavior of Concrete Structures in Service, 787

Bells Under Bells, 1295

Bending of Multi-Bin RC Cylindrical Silos, 977

Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365

Bond Stress/Deformation in Pull-Out Masonry Specimens, 941

Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59

Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808

Computer Graphics in Truss-Model Design Approach, 120

Connections Between Precast Elements—Failure Outside Connection Region, 805

Continuum Damage Theory—Application to Concrete, 284

Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785

Creative Application of Materials Engineering, 1313

Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Cyclic Response of Concrete Bracing Members, 788

Fatigue Behavior of Composite Metal Deck Slabs, 790

Finite Element Model for Curved Embedded Reinforcement, 308

Five-Spring Element for Biaxially Bent R/C Columns, 809

Hysteretic Shear Model for Reinforced Concrete Members, 793

Interior Joints with Variable Anchorage Lengths, 921

Lessons from Explosive Tests on RC Buried Arches, 833

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Nondestructive Load Predictions of Concrete Shell Buckling, 857

On Static Modulus of Elasticity of Normal-Weight Concrete, 940

Parking Garage Crisis, 1262

Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842

Predicting Deflections of Reinforced Concrete

- Beams Analytically, 855
- Punching in R.C. Slabs, 890
- R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
- Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824
- Restoring an Impaired Concrete Silo, 46
- Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Seismic Response of Imperial County Services Building in 1979, 971
- Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854
- Strength and Deformability of Steel Column Footing, 911
- Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843

Concrete slabs

- Pre-Tensioned and Posttensioned Composite Girders, 974
- Punching in R.C. Slabs, 890

Concrete structures

- Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Concrete Lunar Base Investigation, 22
- Dynamic Skin-Friction Effects on Buried Arches, 893
- Formwork Pressures in Tall and Thick Concrete Walls, 88
- On Static Modulus of Elasticity of Normal-Weight Concrete, 940

Concrete technology

- A Hard Look at Concrete, 1178

Confidence intervals

- Correlated Versus Uncorrelated Hydrologic Samples, 1116

Confidence limit

- Pressure and Flow Uncertainty in Water Systems, 1085

- Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

Confined environments

- Turbulent Surface Jet in Channel of Limited Depth, 646

Confined flow

- Automatic Generation of Seepage Flow Nets by Finite Element Method, 119

Confinement

- Analytical Study for Concrete Confinement in Tied Columns, 954
- Turbulent Surface Jet in Channel of Limited Depth, 646

Conflict

- A Better Way, 1292
- Mediating Disputes: Land Development and Construction, 253

- Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072
- Technology, Society, and Water Management, 1074

Conflict of interest

- Mediating Disputes: Land Development and Construction, 253

Connection, joints

- Beam-Column Moment Connections for Composite Frames: Part 2, 958

Connections

- Connections Between Precast Elements—Failure Within Connection Region, 976
- Cyclic Behavior of Double Angle Connections, 852
- Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Splitting Induced by Shear Connectors in Composite Beams, 806
- Strength and Deformability of Steel Column Footing, 911

Connections, bolted

- Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Seismic Response of Low-Rise Steel Frames, 820
- Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964

Connections, joints

- Beam-Column Moment Connections for Composite Frames: Part 1, 957
- Connections Between Precast Elements—Failure Outside Connection Region, 805

Connections, welded

- Welded-Tee End Connections for Circular Hollow Tubes, 975

Connectors, mechanical

- Shear Connector Design for Composite Flexural Members, 814

Conservation

- Coastlines of Italy, 1306
- Mass Conservation: 1-D Open-Channel Flow Equations, 565

Consolidation

- Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540
- Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539
- Consolidation of Sensitive Clay as Phase Change Process, 527
- One-Dimensional Lagrangian Consolidation, 496

Consolidation, soils

- Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481
- Internally Braced Cuts in Overconsolidated Soils, 474
- Nonisothermal Consolidation in Unsaturated Soil, 522
- Tieback Supported Cuts in Overconsolidated Soils, 475

Constitutive equations

- Analytical Model for Shear Slip of Cracked

SUBJECT INDEX

Construction industry

- Concrete, 831
- Constitutive Equations for Concrete in Failure State, 362
- Eccentrically-Obliquely Loaded Footing, 542
- Elasticity of Particulate Materials, 490
- Equivalent Linearization Method in Nonlinear FEM, 292
- Numerical Representation of Bodner Viscoplastic Constitutive Model, 276
- Simple Mean Free Path Theory for Stresses in a Rapid Granular Flow, 340
- Constitutive models**
 - 1D Strain in Normally Consolidated Cohesive Soils, 485
 - Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426
 - Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783
 - Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268
 - Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336
 - Material Behavior and Optimum Design of Structural Systems, 849
 - Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925
 - Numerical Representation of Bodner Viscoplastic Constitutive Model, 276
 - A Self-Adaptive Model for Structural Softening of Brittle Materials, 358
 - Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854
 - Stability of Frictional Materials, 376
 - Structural Analysis of Bimodular Materials, 322
 - Uniaxial Behavior of Concrete in Cyclic Tension, 795
- Constitutive relations**
 - Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371
 - Solidification Theory for Concrete Creep—I. Formulation, 368
 - Solidification Theory for Concrete Creep II. Verification and Application, 369
- Construction**
 - Automated Lay-Down Yard Control System—ALYC, 94
 - Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
 - Comparison of U.S. and Japanese Practices in Public Construction, 92
 - Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63
 - Cost-Estimating Principles, 95
 - Evaluation of New Concepts for Cellular Structure Construction, 61
 - Fired Up at Fort Drum, 1200
 - Impact Analyses of Construction of Kansai International Airport, 1062
 - Lunar Structures Generated and Shielded with On-site Materials, 31
 - Mediating Disputes: Land Development and Construction, 253
 - Organizing to Increase Innovation in the Construction Firm, 99
 - Practical Quality-Controlled Construction, 54
 - Problems of Housing in Kuwait, 1067
 - Process of Innovation for Up/Down Construction at Rows Wharf, 70
 - Properties of Solid Waste Incinerator Fly Ash, 508
 - Resource Leveling in Construction by Optimization, 78
 - Screaming Structures, 1277
 - Simulating Construction Robot Agents and Their Knowledge Environment, 121
 - Simulation of Nonsteady Construction Processes, 69
 - Toward Understanding of Product Innovation Process in Construction, 93
 - Unified Risk Insurance: An Update, 57
- Construction companies**
 - Comparison of U.S. and Japanese Practices in Public Construction, 92
 - Managing for Increased Design and Construction Innovation, 766
 - Organizing to Increase Innovation in the Construction Firm, 99
 - Productivity Database and Job Cost Control Using Microcomputers, 98
 - Technology and Strategic Management in Construction, 740
- Construction control**
 - Conceptual Construction Process Model, 18
 - Emulation for Control System Analysis in Automated Construction, 122
 - Excellence in the Constructed Project, 1317
 - Factors Affecting Construction Planning Efforts, 64
 - Measurement of Work Progress: Quantitative Technique, 89
 - Organizational Evolution I-595 Port Everglades Expressway, 81
 - Simulation of Nonsteady Construction Processes, 69
- Construction costs**
 - Measuring Design and Construction Quality Costs, 83
 - Practical Quality-Controlled Construction, 54
- Construction equipment**
 - Pipe Manipulator Enhancements for Increased Automation, 85
- Construction industry**
 - Automated Lay-Down Yard Control System—ALYC, 94
 - Avoiding and Resolving Disputes in Underground Construction, 1300
 - Computer-Integration: Reducing Fragmentation in AEC Industry, 102
 - Continuing Education for Engineers: University's Role, 255
 - Contractor Financing, Public Works in Saudi Arabia, 60
 - Equipment Policy of Top 400 Contractors: A Survey, 79
 - Impact of Material Management on Productivity—A Case Study, 82

Managing for Increased Design and Construction Innovation, 766
 Measuring Design and Construction Quality Costs, 83
 Positive Influences of Nuclear Construction, 86
 Potential Robotics Utilization in Construction, 67
 Project-Labor Agreements in Construction Industry, 97
 Prototype Robotics in Construction Industry, 77
 They're Coming to America, 1280
 Unified Risk Insurance: An Update, 57

Construction inspection
 Assessment: U.S. Office Building in Moscow, 41
 Brick Masonry: U.S. Office Building in Moscow, 43
 Project Peer Review: Results of the Structural Failures II Conference, 56

Construction management
 Dynamic Probabilistic Decision Processes, 74
 Equipment Policy of Top 400 Contractors: A Survey, 79
 Expert Systems as Construction Management Tools, 745
 Fast Track, Instant Track, 1268
 Impact of Material Management on Productivity—A Case Study, 82
 Knowledge Processing for Construction Management Data Base, 71
 Measurement of Work Progress: Quantitative Technique, 89
 Microcomputer Applications in Simulated CE Project, 757
 Organizational Evolution I-595 Port Everglades Expressway, 81
 Positive Influences of Nuclear Construction, 86
 Process of Innovation for Up/Down Construction at Rows Wharf, 70
 Required Return on Investments in Construction, 66
 Schedule-Based Construction Incentives, 87
 Simulation of Nonsteady Construction Processes, 69
 Structural Materials, 1336

Construction materials
 Construction Materials Quality Management, 47
 Lunar Structures Generated and Shielded with On-site Materials, 31
 Structural Design, Analysis and Testing, 1335
 Toward Understanding of Product Innovation Process in Construction, 93

Construction method
 Riprap Protection Without Filter Layers, 648

Construction methods
 Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
 Building Moon Bases, 1176
 Conceptual Construction Process Model, 18
 Concrete Bridge Design and Construction in the United Kingdom, 100
 Construction and Performance of Two Large Rockfill Embankments, 544
 Excellence in the Constructed Project, 1317

Grouting Trends, 1274
 Impact of Material Management on Productivity—A Case Study, 82
 Lunar Structures Generated and Shielded with On-site Materials, 31
 Management Challenges of Integrating Construction Methods and Design Approaches, 744
 Positive Influences of Nuclear Construction, 86
 Process of Innovation for Up/Down Construction at Rows Wharf, 70
 Rebuilding Roebling Delaware Aqueduct Bridge, 865
 Reclamation of Exxon Ray Point Tailings Basin, 444
 Remote Oil and Gas Facility Construction, 73
 Simulating Construction Robot Agents and Their Knowledge Environment, 121
 Simulation of Nonsteady Construction Processes, 69
 Strategies for Mitigating Damage to Metal Building Systems, 26
 Strategies for Wind Damage Mitigation—Summary, 36
 Unbonded Performance, 1275
 Wind Damage to Masonry Buildings, 37
 Wind Design Problems with Building Structures During Construction, 29

Construction planning
 Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299
 Estimating Precipitation Impacts for Scheduling, 96
 Factors Affecting Construction Planning Efforts, 64
 New Roof for an Aging Temporary, 1276
 Time-Cost Trade-off Among Related Activities, 90
 Weather in Construction Contracts, 76

Construction site accidents
 Setting Sights on Safety, 1177

Construction sites
 Remote Oil and Gas Facility Construction, 73
 Robotic Roundup, 1222

Consultants
 Establishing, Operating, and Controlling an Engineering Consulting Firm, 235
 Fees Versus Quality, 244
 Organizational Evolution I-595 Port Everglades Expressway, 81
 Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Consulting engineers
 Assessing Site Assessments, 1273
 Establishing, Operating, and Controlling an Engineering Consulting Firm, 235
 Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Consulting services
 Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Contact pressure
 Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426

SUBJECT INDEX

Convolution Integrals

Frictional Punch and Crack in Plane Elasticity, 333

Contaminants

Bioremediation: Testing the Waters, 1247

Considerations for Capping Subaqueous Dredged Material Deposits, 1169

Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187

Modeling of Enhanced Biodegradation in Unsaturated Soil Zone, 150

Contamination

Augering Answers, 1289

Continuing education

Cold Regions Environmental Engineering: Tomorrow's Challenges, 135

Continuing Education for Engineers: University's Role, 255

First, Second, and Third Thoughts on Civil Engineering Education, 231

Training the Waste Watchers, 1254

Continuity equation

Modeling of Unsteady Flow in Curved Channel, 638

Continuous beams

Continuum Models of Space Station Structures, 40

Continuous structures

Nonlinear Mixed-Discrete Structural Optimization, 822

Continuum mechanics

Dynamics of Saturated Rocks. I: Equations of Motion, 233

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Measurement of Characteristic Length of Nonlocal Continuum, 309

Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925

Contract administration

A Better Way, 1292

Impact Analysis of Owner-Directed Acceleration, 68

Measurement of Work Progress: Quantitative Technique, 89

Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Schedule-Based Construction Incentives, 87

Contract terms

Avoiding and Resolving Disputes in Underground Construction, 1300

A Better Way, 1292

Cautious Risk Taking, 1271

Comparison of U.S. and Japanese Practices in Public Construction, 92

Fees Versus Quality, 244

Negotiating and Drafting the Civil Engineering Contract, 756

Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Weather in Construction Contracts, 76

Contracting

Comparison of U.S. and Japanese Practices in

Public Construction, 92

Contraction

Blockage Correction for Sharp-Edged Bluff Bodies, 360

Contractors

Contractor Financing, Public Works in Saudi Arabia, 60

Equipment Policy of Top 400 Contractors: A Survey, 79

Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Productivity Database and Job Cost Control Using Microcomputers, 98

Schedule-Based Construction Incentives, 87

They're Coming to America, 1280

Contracts

Avoiding and Resolving Disputes in Underground Construction, 1300

Comparison of Labor Agreements, 65

Comparison of U.S. and Japanese Practices in Public Construction, 92

Excellence in the Constructed Project, 1317

Fees Versus Quality, 244

Negotiating and Drafting the Civil Engineering Contract, 756

Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753

Project-Labor Agreements in Construction Industry, 97

Control

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

DYN² Method for Optimal Control of Water Flow in Open Channels, 728

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Implementation Strategies for Salinity Projects, 1114

Optimization of Structural Design Checking, 932

Stable Predictive Control of Open-Channel Flow, 710

Water Beneath the City Streets, 1251

Control structures

Emulation for Control System Analysis in Automated Construction, 122

Control systems

Active Optimal Control of Structure Using Optimal Observer, 421

Automated Lay-Down Yard Control System —ALYC, 94

Implementation Strategies for Salinity Projects, 1114

Convergence

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Convolution Integrals

Viscous Damping: Time Convolution of the Impulsive Solution, 652

Cooling systems

Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91

Cooling water

Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91

Cooperation

Beautiful Bridges, 1255

Cooperative education

Continuing Education for Engineers: University's Role, 255

Quality Undergraduate Engineering Education—A Critical Perspective, 241

Coordinates

Fundamentals of GPS Baseline and Height Determinations, 996

General Direct Method for Land Subdivision, 1012

Coordination

GPS Satellite Surveys and Vertical Control, 1000

Corners

A Crack Initiating from Rhombic Rigid Inclusion, 431

Corporations

The Long Arm of Liability, 1265

Correlation analysis

Correlated Versus Uncorrelated Hydrologic Samples, 1116

Stochastic Finite Element Expansion for Random Media, 326

Correlation techniques

Low-Flow Frequency Analysis Using Probability-Plot Correlation Coefficients, 1092

Corrosion

Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878

Cold Regions Environmental Engineering: Tomorrow's Challenges, 135

Concrete Degradation Due to Thermal Incompatibility of Its Components, 777

Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892

Kinetics of Reaction of SO_2 with Marble, 773

Marine Curing of Steel Fiber Composites, 775

Parking Garage Crisis, 1262

Post-Tensioned Transportation, 1272

Restoring an Impaired Concrete Silo, 46

Shelf Angles for Masonry Veneer, 815

Unbonded Performance, 1275

Corrosion control

Segmental Tunnel Lining Meets 'Buy American', 1269

Corrosion resistance

High-Strength Concrete: Weighing the Benefits, 1282

Cost analysis

Application of Robotics in Bridge Deck Fabrication, 62

Center-Pivot End Gun Irrigation Cost Analysis, 722

Computerized Life-Cycle Cost Systems in the

Army, 107

Cost-Estimating Principles, 95

HSR Cost Estimating Techniques in Pennsylvania, 1021

Hubbing and Airline Costs, 1053

Measuring Design and Construction Quality Costs, 83

Risk Assessment of Extreme Events: Application, 1090

Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117

Cost control

Cost-Estimating Principles, 95

Productivity Database and Job Cost Control Using Microcomputers, 98

Cost effectiveness

Accelerating Electrons, 1211

Application of Robotics in Bridge Deck Fabrication, 62

Detecting the Defects, 1263

Fundamentals of GPS Baseline and Height Determinations, 996

High Hopes for Cattails, 1215

Hubbing and Airline Costs, 1053

On Least-Cost Design of Aqueduct Systems, 1102

Optimal Pump Operation in Water Distribution, 558

Preventive Maintenance: Fixing What Ain't Broke, 1261

Risk Analysis for Dam Design in Karst, 492

Seepage and Contraction Joints in Concrete Canal Linings, 686

Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151

Water-Quality Management Through Combined Simulation-Optimization Approach, 201

Cost estimates

Cost-Estimating Principles, 95

HSR Cost Estimating Techniques in Pennsylvania, 1021

Predesign Planning for Parking Facilities, 759

Cost minimization

Methodology for Improving Pump Operation Efficiency, 1081

Minimization of Raw Water Pumping Costs Using MILP, 1104

On Least-Cost Design of Aqueduct Systems, 1102

Optimization Model for Water Distribution System Design, 632

Recursive Optimization for Seismic Steel Frames, 812

Water Distribution System Design Under Uncertainties, 1111

Costs

Restructuring Organizations: Alternatives and Costs, 746

Time-Cost Trade-off Among Related Activities, 90

Truck Capacity Selection for Earthmoving, 72

Cotton

Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692

SUBJECT INDEX

Crop production

Management Model for Control of On-Farm Irrigation, 727

Counterweight

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Coupled walls

Elastic Design Charts of Stiffened Coupled Structural Walls, 801

Stiffened Coupled Shear Walls, 305

Coverings

Considerations for Capping Subaqueous Dredged Material Deposits, 1169

Hood Characteristics for Siphon-Shaft Spillways, 588

Crack

Frictional Punch and Crack in Plane Elasticity, 333

Crack initiation

A Crack Initiating from Rhombic Rigid Inclusion, 431

Crack propagation

Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823

Crack Control in Beams Using Deformed Wire Fabric, 945

Fissure Parameters in Stiff Clays Under Compression, 518

Measurement and Description of Tensile Fracture in Granite, 382

Cracked

Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Cracking

Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823

Behavior of Concrete Structures in Service, 787

Crack Control in Beams Using Deformed Wire Fabric, 945

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Nonlinear Seismic Analysis of Arch Dams, 310

Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842

Restoring an Impaired Concrete Silo, 46

Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854

Simulation of Cracking in Large Arch Dam: Part I, 882

Simulation of Cracking in Large Arch Dam: Part II, 883

Size Effects on Strength, Toughness and Ductility, 347

Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943

Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843

Cracks

Analysis of R/C Panels Using Different Concrete Models, 298

Analytical Model for Shear Slip of Cracked Concrete, 831

Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268

Crack Control in Beams Using Deformed Wire Fabric, 945

A Crack Initiating from Rhombic Rigid Inclusion, 431

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436

Estimation of Uplift Pressures in Cracks in Older Concrete Gravity Dams 2: Effect of Head Losses in Drain Pipes on Uplift, 437

Measurement of Characteristic Length of Nonlocal Continuum, 309

Mode I Fracture in Concrete Using Center-Cracked Plate Specimens, 285

Size Effects on Strength, Toughness and Ductility, 347

Creativity

Does Ethical Engineering Practice Affect Creativity?, 4

Creep

Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938

Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Creep Buckling of Cylindrical Shell Under Variable Loading, 327

Model of Finite Strain Creep of Metals, 353

Numerical Representation of Bodner Viscoplastic Constitutive Model, 276

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Predicting Deflections of Reinforced Concrete Beams Analytically, 855

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

Solidification Theory for Concrete Creep—I. Formulation, 368

Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Viscoelastic Stability of Columns on Continuous Support, 354

Critical load

Effective Length Spectra for Cross Bracings, 972

Stability of Pretwisted Bars with Various End Torques, 304

Critical path method

Current Float Techniques for Resources Scheduling, 84

Time-Cost Trade-off Among Related Activities, 90

Crop production

Gravity Irrigation Management in Bangladesh, 705

Systems Analysis of Tank Irrigation: I. Crop Staggering, 687

Water Resources Management in North China Plain, 1109

Crop yield

- Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672
- Evaluation of Irrigation Planning Decisions, 663
- Gravity Irrigation Management in Bangladesh, 705
- Management Model for Control of On-Farm Irrigation, 727
- Modeling Yields from Rainfall and Supplemental Irrigation, 677
- Optimal Scheduling of Irrigation Machines: I—Model Development, 723
- Optimal Scheduling of Irrigation Machines: II—Applications and Results, 724
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688

Crops

- Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32
- Irrigation Scheduling Model with Ground Water and Limited Rooting, 726
- Optimization Models for Wastewater Reuse in Irrigation, 673
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688

Cross sections

- Routing Procedure for Ungaged Channels, 1079
- Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Crossflow

- Capped Water Intakes in a Stratified Crossflow, 563

Culverts

- Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465
- Model Study of Safety Grating for Culvert Inlet, 1024
- Response of Buried Cylinders to Surface Loads, 1

Curing

- Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772
- Marine Curing of Steel Fiber Composites, 775

Currents

- Acoustic Measurement of River Discharge, 603
- Bottom Boundary Layer Under Nonlinear Wave Motion, 1127
- Compendium of International Ocean Energy Activities, 1309
- Hydrodynamic Forces on Seabed Pipelines, 1136
- Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158
- Simulation of Wind-Induced Water Currents, 616
- Wave-Tubular Member—Wave and Current Interaction, 1170

Curricula

- Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250

Curtain walls

- Lateral Buckling in Curtain Wall Systems, 934

Curvature

Computer-Aided Design for Horizontal Alignment, 1042

Exact or Lower Bound Tapered Column Buckling Loads, 851

Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391

Finite Element Model for Curved Embedded Reinforcement, 308

Reciprocal Conjugate Method for Space Curved Bars, 818

Curve fitting

Numerical Representation of Bodner Viscoplastic Constitutive Model, 276

Curved beams

- Curved Beam Elements for Nonlinear Analysis, 314
- Equations of Curved Beams, 329
- Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391

Cyclic loads

- Behavior of Brick Masonry Under Cyclic Compressive Loading, 872
- Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481
- Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
- Brace Fractures and Analysis of Phase I Structure, 904
- Cyclic Behavior of Clays in Undrained Simple Shear, 482
- Cyclic Load Behavior of Bolted Timber Joint, 935
- Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969
- Experimental p - y Model for Submerged Stiff Clay, 451
- Fatigue Behavior of Composite Metal Deck Slabs, 790
- Hysteretic Shear Model for Reinforced Concrete Members, 793
- Lateral Pile Interaction Factors in Submerged Sand, 466
- Loading and Unloading Stress-Strain Curves for Brick Masonry, 944
- Model for Response of Concrete To Random Compressive Loads, 953
- Model Tests of Gravity Platforms: Description, 533
- Model Tests of Gravity Platforms: Interpretation, 534
- Rate-Dependent Material Model for Structural Steel, 291
- Response of Masonry Bed Joints in Direct Shear, 922
- Seismic Performance of Steel Frames with Inverted V Braces, 907
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964
- Undrained Behavior of Clay Under Cyclic Shear Stresses, 500
- Uniaxial Behavior of Concrete in Cyclic Tension, 795
- Cyclic tests**
- Cyclic Behavior of Double Angle Connections, 852

Cyclic Response of Concrete Bracing Members, 788

Cylinders

Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422

Elastic Stability of Cylindrical Shells with Weld Depressions, 860

Flow-Induced Vibrations of Rectangular Cylinders, 627

Force Oscillator Model for Rectangular Cylinder, 344

Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156

Laser Measurements and Computations of Viscous Flows Through Cylinders, 621

Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173

A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338

Stress, Vibration and Buckling of Multilayered Cylinders, 789

Wind Induced Vibration of Two Flexible Cylindrical Structures, 392

Cylindrical shells

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Buckling Behavior of Pressure Loaded Cylindrical Panels, 283

Elastic Stability of Cylindrical Shells with Weld Depressions, 860

Elastic Stability of Lap-Jointed Cylinders, 825

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Cylindrical tanks

Bending of Multi-Bin RC Cylindrical Silos, 977

Dam breaches

Limitations of de Saint Venant Equations in Dam-Break Analysis, 605

Spillway Discharge Calculations in NWS DAMBRK, 607

Dam construction

1990: Decade of Natural Disaster Reduction, 1294

Dam design

Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations, 613

Risk Analysis for Dam Design in Karst, 492

Rx for Dam Repair, 1278

Slit Dam Design for Debris Flow Mitigation, 625

Dam failure

Dam-Break Flows in Curved Channel, 637

Models of Dam-Break Flow in *R-T* Space, 584

Rx for Dam Repair, 1278

Dam safety

Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations, 613

Private Sector Risk Analysis: Applied to Dam Safety, 765

Risk Analysis for Dam Design in Karst, 492

Risk Assessment of Extreme Events: Application, 1090

Safer Dams, 1259

Dam site selection

Slit Dam Design for Debris Flow Mitigation, 625

Damage

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Heat-Straightening Prototype Damaged Bridge Girders, 884

Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925

Rubble-Mound Breakwaters with S-Shape Design, 1160

Signal Separation Method for Tower Mode Shape Measurement, 827

Strategies for Wind Damage Mitigation-Summary, 36

Weather in Construction Contracts, 76

Wind Damage to Masonry Buildings, 37

Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Damage accumulation

Continuum Damage Theory—Application to Concrete, 284

Damage assessment

Repair and Completion of Damaged Cooling Tower, 819

Signal Separation Method for Tower Mode Shape Measurement, 827

Damage estimation

Production, Cost, and Increased Salinity in Water, 1123

Damage patterns

Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268

Damage prevention

Rubble-Mound Breakwaters with S-Shape Design, 1160

Strategies for Mitigating Damage to Metal Building Systems, 26

Strategies for Wind Damage Mitigation-Summary, 36

Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Damages

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Damping

Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171

- Analytical Model for Longitudinal Soil Vibration, 463
- Design Method for Bridges on Lead-Rubber Bearings, 966
- Dynamic Synthesis of Nonclassically Damped Substructures, 265
- Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951
- Eigenproperties of Classically Damped MDOF Composite Systems, 356
- Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
- Interaction of Tide and River Flow, 1130
- Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472
- Role of Damping in Anomalous Response to Short Pulse Loading, 434
- Seismic Design of Bridges on Lead-Rubber Bearings, 965
- Study of Inelastic Spectra With High Damping, 871
- Validity of Smith Model in Pile Driving Analysis, 517
- Vertical Vibration of Machine Foundations, 449
- Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146
- Viscous Damping: Time Convolution of the Impulsive Solution, 652

Dams

- Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439
- Continuous Deformation Monitoring with GPS, 985
- Dams Reborn, 1214
- Design of Efficient Side-Channel Spillway, 624
- Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436
- Geosynthetic Shields For Dams, 1181
- Mathematical Modeling of Fluvial Sand Delivery, 1144
- Rx for Dam Repair, 1278
- Slit Dam Design for Debris Flow Mitigation, 625
- Staging of Water Resource Developments, 438
- Test Embankment Dam of Fracture Grouting, 541
- Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166

Dams, arch

- Nonlinear Seismic Analysis of Arch Dams, 310
- Shape Optimal Design of Arch Dam, 929
- Simulation of Cracking in Large Arch Dam: Part I, 882
- Simulation of Cracking in Large Arch Dam: Part II, 883

Dams, concrete

- Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91
- Reliability Analysis of the Mohr Failure Criterion, 290
- Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12
- Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11

- Spatial Action of Straight Gravity Dams in Narrow Valleys, 826

Dams, earth

- Critical Filters for Impervious Soils, 498
- Improved Filter Criterion for Cohesionless Soils, 450
- Investigation of Crushed Rock Filters for Dam Embankment, 468
- Polynomial Regression to Forecast Earth Dam Piezometer Levels, 698
- Quick Response on the Mississippi, 1256
- Safer Dams, 1259

Dams, gravity

- Estimation of Uplift Pressures in Cracks in Older Concrete Gravity Dams 2: Effect of Head Losses in Drain Pipes on Uplift, 437
- Hydrodynamic Pressure on Gravity Dams Subjected to Ground Motions, 299
- Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12
- Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11
- Spatial Action of Straight Gravity Dams in Narrow Valleys, 826

Darcy's law

- Nonlinear Steady State Seepage into Drains, 685

Data analysis

- Time Series Analysis of Water Quality Data in Pearl River, China, 176

Data banks

- Developing a Data Base for Use in Groundwater Management, 1077
- Semi-Rigid Steel Beam-to-Column Connections: Data Base and Modeling, 791

Data collection

- Application of VADAS to Complex Traffic Environments, 1050
- Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579
- Goods Transportation in Urban Areas, 1319
- A Hazardous Data Explosion, 1296
- Is Advanced Technology "The Gateway to Irresponsibility?", 259
- Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640
- Multipoint Monitoring, 1253
- PC-Based Data Acquisition System for Structural Monitoring, 123
- Remote Sensing and Fully Distributed Modeling for Flood Forecasting, 1122
- Strategic Planning Tool for GPS Surveys, 994

Data handling

- A Hazardous Data Explosion, 1296
- Presented in 3-D, 1226

Data processing techniques

- Modified Frequency-Domain Data Processing, 408

Data reduction

- A Hazardous Data Explosion, 1296

Data systems

SUBJECT INDEX

Deformation

Semi-Rigid Steel Beam-to-Column Connections:
Data Base and Modeling, 791

Database management system

Facilities Management With CADD, 1232

Database management systems

Bullwinkle, 1234

Decision Support for Estuarine Water Quality
Management, 1120

A Hazardous Data Explosion, 1296

Knowledge Processing for Construction Manage-
ment Data Base, 71

Presented in 3-D, 1226

Statistics-Based Approach to Wastewater Treat-
ment Plant Operations, 180

Databases

New Basis for Earthwork Specification for Clay
Soil, 537

Debris

Slit Dam Design for Debris Flow Mitigation, 625

Decision making

Action Versus Planning, 747

Computerized Decision Support Systems for Water
Managers, 1311

Decision Support for Estuarine Water Quality
Management, 1120

Dynamic Probabilistic Decision Processes, 74

Evaluation of Subsurface Exploration Programs, 80

Intelligent Decision Support and Reservoir Man-
agement and Operations, 125

Knowledge-Based System for Soil Improvement,
118

Multicriterion Analysis of Hydropower Operation,
445

Optimization of Structural Design Checking, 932

Pre-design Planning for Parking Facilities, 759

Private Sector Risk Analysis: Applied to Dam
Safety, 765

Risk Analysis and Management of Natural and
Man-Made Hazards, 1330

Risk Analysis for Dam Design in Karst, 492

Risk Assessment of Extreme Events: Application,
1090

Technology, Society, and Water Management, 1074

Use of Binary Choice Decision Process for Adap-
tive Signal Control, 1033

Decomposition

Mass-Balance Analysis of Anaerobically Decom-
posed Refuse, 207

Mathematical Interpretation of Aqueous-Phase
Ozone Decomposition Rates, 173

Simplified Equations for Effectiveness Factors in
Anaerobic Biofilms, 210

Deep foundations

Foundation Engineering: Current Principles and
Practices, 1318

Definitions

Does Civil Engineering Need System Engineering?,
227

Deflection

Analytical Study of Prestressed Composite Beams,
927

Behavior of Concrete Structures in Service, 787

Distortion of Steel Tanks Due to Settlement of
Their Walls, 495

Dynamic Response of Elastic Plates on Viscoelastic
Half Space, 378

Engineering Large Deflection Theory for Thick
Plates, 320

Equivalent Systems for Variable Thickness Plates,
405

Experimental Study of Prestressed Composite
Beams, 926

Finite Strip-Elements for Thick Plate Analysis, 335

Large Deflections of Orthotropic Plates Under
Pressure, 423

Lateral Wall Deflections of Braced Excavations in
Clay, 494

Material Behavior and Optimum Design of Struc-
tural Systems, 849

Predicting Deflections of Reinforced Concrete
Beams Analytically, 855

Pseudolinear and Equivalent Systems for Large
Deflections of Members, 414

Pumping Prediction Model for Highway Concrete
Pavements, 1026

Scheme for Elasticas with Snap-Back and Looping,
398

Segmental Box Girder: Deflection Probability and
Bayesian Updating, 937

Seismic Response of Low-Rise Steel Frames, 820

Shear Connector Design for Composite Flexural
Members, 814

Spatial Action of Straight Gravity Dams in Narrow
Valleys, 826

Stability Functions for Three-Dimensional Beam-
Columns, 813

Stability of Spherical Shells on Elastic and Visco-
elastic Foundations, 331

Tapered Box Columns Under Biaxial Loading, 888

Deformation

Analytical Study on Deformation of Fresh Con-
crete, 293

Asymmetrical Buckling of Prestressed Tapered
Arches, 388

Behavior of Brick Masonry Under Cyclic Com-
pressive Loading, 872

Behavior of Concrete Structures in Service, 787

Behaviors of Steel and Composite Beams at Various
Displacement Rates, 910

Bond Stress/Deformation in Pull-Out Masonry
Specimens, 941

Continuous Deformation Monitoring with GPS,
985

Deformation Characteristics of Reinforced Sand in
Direct Shear, 509

Dynamics and Control of Elevators with Large
Gaps and Rubber Dampers, 951

Equations of Curved Beams, 329

Experimental p - y Model for Submerged Stiff Clay,
451

Finite Element Analysis of Some Inverse Elasticity
Problems, 342

Finite Element Modeling of Left Ventricle, 375

Load-Shortening Relationships for Bars, 889

Pipeline Deformation Monitoring Using GPS Sur-

- vey Techniques, 982
- Prestressed-Steel Continuous-Span Girders, 867
- Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456
- Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470
- Strength and Deformability of Steel Column Footing, 911
- Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334
- Structural Analysis of Bimodular Materials, 322
- Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Degradation

- Guide for Estimating Riverbed Degradation, 571

Degrees of freedom

- Eigenproperties of Classically Damped MDOF Composite Systems, 356
- Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
- Mode-Superposition Methods for Elastoplastic Systems, 400
- Role of Damping in Anomalous Response to Short Pulse Loading, 434
- Seismic Failure Rates of Multistory Frames, 802

Deicing

- Freeze-Thaw Deterioration of Concrete Pavements, 776

Delaware

- Irrigated Agriculture and Water Quality in the East, 719

Delay time

- Impact Analysis of Owner-Directed Acceleration, 68
- Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036
- Weather in Construction Contracts, 76

Demographic projections

- Summer Institutes for Minority High School Students, 236

Denitrification

- Biological Denitrification of Water, 196
- Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184

Densification

- Volume Change Behavior of Vibrated Sand Columns, 462

Density

- Diatomaceous Soils: A New Approach, 1191
- Interfacial Stability in Stratified Channel Flows, 619

Density currents

- Density Measurement of Particle and Floc Suspensions, 574
- Thermally Induced Density Currents in Nonrectangular Sidearms, 628

Density measurement

- Density Measurement of Particle and Floc Suspensions, 574

Deoxygenation

- Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098

Deposition

- Breakthrough Curves in Granular Media Filtration, 188

Depth

- Channel Tunnel, Texas Style, 1286
- Effect of Pond Depth on Bacterial Mortality Rate, 198

- Flow Measurement with Trapezoidal Free Overfall, 667

- Form Resistance in Gravel Channels with Mobile Beds, 570

Desalination plants

- Membranes in Water Treatment, 1220

Deserts

- Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Design

- Affordable Housing: a Challenge to Civil Engineers, 1297

- Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

- Basic Problem on Optimal Spatial Cable Layout, 330

- Breaking Wave Forces on Vertical Walls, 1128

- Building the Perfect Playpen, 1281

- Checking Models in Structural Design, 864

- Civil Engineering Design Professors Should be Registered Engineers, 240

- Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

- Communications Failure in Hyatt Regency Disaster, 245

- Computer Graphics in Truss-Model Design Approach, 120

- Computer-Integration: Reducing Fragmentation in AEC Industry, 102

- CSTRUCT: Computer Environment for Design of Steel Structures, 115

- Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950

- Design Interaction Equation for Steel Beam-Columns, 859

- Design of Efficient Side-Channel Spillway, 624

- Design of Wastewater Storage Ponds at Land Treatment Sites. 1: Parallels with Applied Reservoir Theory, 182

- Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

- Designing the Design Engineer, 243

- Development and Design of Sludge Freezing Beds, 189

- Direct Land Grading Design of Irrigation Plane Surfaces, 680

- Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821

- The Effect of Compatibility and Prestressing on Optimized Trusses, 828

- Elastic and Plastic Designs for Maximum Load, 866

- Elastic Buckling of Buried Flexible Tubes—A

Review of Theory and Experiment, 465
 Fired Up at Fort Drum, 1200
 Guidelines for Flexural Design of Prestressed Composite Beams, 962
 Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715
 Hood Characteristics for Siphon-Shaft Spillways, 588
 Human Error in Structural Design Tasks, 895
 Interior Joints with Variable Anchorage Lengths, 921
 Lateral Buckling in Curtain Wall Systems, 934
 Limitations in Decision Making and System Performance, 45
 Linking Civil Engineering Design and Drafting Software via IGES, 116
 Management Challenges of Integrating Construction Methods and Design Approaches, 744
 Managing for Increased Design and Construction Innovation, 766
 Measuring Design and Construction Quality Costs, 83
 Mediating Disputes: Land Development and Construction, 253
 Microcomputer-Aided Analysis and Design of Steel Frames, 109
 Modeling for Class-I Sedimentation, 214
 Modification of Behavior of Double-Layer Grids: Overview, 847
 New Basis for Earthwork Specification for Clay Soil, 537
 New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876
 Optimum Diversion Plan for Hydropower Scheme, 1084
 Ports '89, 1325
 Positive Influences of Nuclear Construction, 86
 Practical Quality-Controlled Construction, 54
 Presented in 3-D, 1226
 Prestressed-Steel Continuous-Span Girders, 867
 Reliability Analysis of Water Distribution Systems, 1328
 Riprap Design, 604
 Shear Connector Design for Composite Flexural Members, 814
 Steel Structures, 1334
 Submergence Factors for Hydraulic Turbines, 442
 Toward Understanding of Product Innovation Process in Construction, 93
 Water Storage Capacity of Wetland Used for Wastewater Treatment, 191
 Welded-Tee End Connections for Circular Hollow Tubes, 975
 What is an "Ethical" Engineer?, 763
Design criteria
 Beautiful Bridges, 1255
 Buckling Behavior of Pressure Loaded Cylindrical Panels, 283
 Building the Perfect Playpen, 1281
 Construction and Performance of Two Large Rockfill Embankments, 544
 Design Analysis of Cable Networks, 973
 Design of Urban Runoff Quality Controls, 1314

Effective Length Spectra for Cross Bracings, 972
 Glitches in Flitch Beam Design, 1260
 Improved Filter Criterion for Cohesionless Soils, 450
 Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158
 Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942
 Material Behavior and Optimum Design of Structural Systems, 849
 Prager-Shield Optimality Criteria for Linear Segmentation, 273
 Rebuilding Philadelphia's El, 1187
 Reclamation of Exxon Ray Point Tailings Basin, 444
 Repair and Completion of Damaged Cooling Tower, 819
 Staging of Water Resource Developments, 438
 Strategies for Mitigating Damage to Metal Building Systems, 26
 Uncertainties in Establishing Design Earthquakes, 5
 Web-Crippling Strength of Cold-Formed Steel Beams, 936
 Wind Design Problems with Building Structures During Construction, 29
Design data
 AASHTO Flexible Pavement Design Equation Study, 1052
 Beam-Column Moment Connections for Composite Frames: Part 2, 958
 Welded-Tee End Connections for Circular Hollow Tubes, 975
Design improvements
 AASHTO Flexible Pavement Design Equation Study, 1052
 Box Segmentals: Refining Design, 1270
 Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951
Design standards
 Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950
 Efficiency of Detachable Platforms in the Arctic, 128
 Isolated Examples, 1284
Detention basins
 Sensitivity Study of Detention Basins in Urbanized Watershed, 1069
Detention reservoirs
 Detention Pond Sizing for Multiple Return Periods, 589
Deterioration
 Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
 Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878
 From Guesswork to Guarantee?, 1264
 Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774
 Rx for Dam Repair, 1278
Developing countries
 Affordable Housing: a Challenge to Civil Engineers, 1297

Future Irrigation Prospects and Actions in Developing World, 706
 Selection of GPS Receiver for Survey Applications, 986

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Development

Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095

Dewatering

Development and Design of Sludge Freezing Beds, 189

Diaphragms

Finite Element Modeling of Wood Diaphragms, 817

Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810

Diatomeaceous earth

Diatomeaceous Soils: A New Approach, 1191

Differential equations

Analytical Model of Level Basin Irrigation, 664

Differential settlement

Differential Settlements in Steel Tanks, 2

Diffraction

Diffraction of SV Waves by Circular Canyons of Various Depths, 389

Stem Waves Along Breakwater, 1163

Diffusers

Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194

Measurement of Upwelling Flow from Air Diffuser, 220

Ocean Outfalls. I. Submerged Wastefield Formation, 550

Ocean Outfalls. II: Spatial Evolution of Submerged Wastefield, 551

Ocean Outfalls. III: Effect of Diffuser Design on Submerged Wastefield, 552

Diffusion

Diffusion in Gas Under Constant Pressure Drop, 383

Dynamic Model of Nitrification in a Fluidized Bed, 195

Parameter Evaluation for Carbon Adsorption, 148
 Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210

Diffusion coefficient

Parameter Evaluation for Carbon Adsorption, 148

Digital mapping

Developments of Geographic Information Systems Technology, 1003

Digital techniques

Simulation of Seismic Ground Motion Using Stochastic Waves, 430

Dikes

Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692

Dilatancy

Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Nonlinear Failure Envelope for Soils, 479

Response of Masonry Bed Joints in Direct Shear, 922

Dilution

Axial Dilution in Obstructed Round Buoyant Jet, 553

Design of Dilution Junctions for Water-Quality Control, 1124

Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576

Ocean Outfalls. I. Submerged Wastefield Formation, 550

Ocean Outfalls. II: Spatial Evolution of Submerged Wastefield, 551

Ocean Outfalls. III: Effect of Diffuser Design on Submerged Wastefield, 552

Dimensional analysis

Effect of Sediment Density on Bed Load Transport, 556

Disasters

1990: Decade of Natural Disaster Reduction, 1294

Discharge

Form Resistance in Gravel Channels with Mobile Beds, 570

River Quality Modeling: Time Domain Approach, 707

Toward a New Rational Method, 622

Discharge coefficients

Finite Analytic Solution of Flow Over Spillways, 425

Hood Characteristics for Siphon-Shaft Spillways, 588

Discharge measurement

Acoustic Measurement of River Discharge, 603

Flow Measurement with Trapezoidal Free Overfall, 667

Ocean Outfalls. I. Submerged Wastefield Formation, 550

Ocean Outfalls. II: Spatial Evolution of Submerged Wastefield, 551

Ocean Outfalls. III: Effect of Diffuser Design on Submerged Wastefield, 552

Sloping Crest Crump Weir, 676

Discrete elements

Discrete Numerical Model for Soil Mechanics, 467

Modeling for Class-I Sedimentation, 214

Nonlinear Mixed-Discrete Structural Optimization, 822

Discriminate analysis

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Disinfection

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Dispersion

Diagnostic Model of Dispersion in Porous Media, 562

Modeling Mixed Sediment Suspended Load Profiles, 594

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394
Simple Groundwater Laboratory Models, 597
Unification of Muskingum Difference Schemes, 582

Displacement

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406
Behaviors of Steel and Composite Beams at Various Displacement Rates, 910
Buckling Loads of Columns with Varying Cross Sections, 303
Centrifuge Study of Faulting Effects on Tunnel, 499
Eccentrically-Obliquely Loaded Footing, 542
Equations Describing Sprinkler Droplet Velocity, 670
Recursive Optimization for Seismic Steel Frames, 812
Scheme for Elasticas with Snap-Back and Looping, 398

Displacements

Model Tests of Gravity Platforms: Interpretation, 534
Observed Performance of a Deep Excavation in Clay, 504
Role of Damping in Anomalous Response to Short Pulse Loading, 434

Dissolved oxygen

Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439
Predicting Reaeration Rates in Texas Streams, 178

Dissolved solids

Measurement of Reaeration in Streams: Comparison of Techniques, 200
River Quality Modeling: Time Domain Approach, 707
Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216

Distance measuring equipment

Free Tension Concept for Precise Taping, 1014

Distortion

Distortion of Steel Tanks Due to Settlement of Their Walls, 495

Distribution

New Plotting Position Formula for Pearson Type-III Distribution, 591

Diversion

Lake Michigan Diversion and Illinois Waterways, 1140
Optimum Diversion Plan for Hydropower Scheme, 1084

Division

Pressure Recovery in Dividing Open Channels, 610

Docks

Interaction of Finite Amplitude Waves with Platforms or Docks, 1126
Ports '89, 1325

Domes, structural

Asymmetrical Buckling of Prestressed Tapered Arches, 388
Domed Renovations, 1257

Fabric Meets Cable, 1188
Limit State Analysis of Masonry Domes, 837

Douglas fir

Further Studies on Elastic Properties of Douglas Fir, 770

Downdrag

Splitting Induced by Shear Connectors in Composite Beams, 806

Downdrag

Downdrag Forces in Group of Piles, 491

Drag

Blockage Correction for Sharp-Edged Bluff Bodies, 360
Hydraulic Jump as "Mixing Layer", 647
Model for Calculating Bed Load Transport of Sediment, 555
Simple Approach to Air and Water Drag on Sea Ice, 1154
Wave-Tubular Member—Wave and Current Interaction, 1170

Drag coefficient

Blockage Correction for Sharp-Edged Bluff Bodies, 360
Simple Approach to Air and Water Drag on Sea Ice, 1154

Drainage

Agricultural Drainage Water—How Should it be Regulated in California?, 657
Effect of Envelopes on Flow Pattern Near Drain Pipe, 704
Generalization of SCS Curve Number Method, 668
Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
Irrigation and Drainage Strategies in Salinity-Affected Regions, 679
Irrigation-Induced Contamination: How Real a Problem?, 658
National Water Conference, 1324
On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716
Pumping Prediction Model for Highway Concrete Pavements, 1026
Regulation of Agricultural Drainage to the San Joaquin River, 660
Research Needs in Irrigation and Drainage—1989, 711
Selection of Stormwater Model Parameters, 153
Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
Urban Groundwater Rise Control: Case Study, 702
Verification of Kirkham's Problem of Layered Soil Drainage, 696

Drainage systems

Nonlinear Steady State Seepage into Drains, 685
Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Drains

Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436
Estimation of Uplift Pressures in Cracks in Older Concrete Gravity Dams 2: Effect of Head Losses in Drain Pipes on Uplift, 437

New Drain Flow Formula, 675
 Nonlinear Steady State Seepage into Drains, 685

Drawdown

Nonlinear Flow Toward Wells, 561

Dredging

Considerations for Capping Subaqueous Dredged Material Deposits, 1169
 Ports '89, 1325
 Water Jets Fight Silt, 1180

Drift

Analysis of Multitriangular-Braced Structures, 896

Driven piles

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501
 Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327
 Skin Friction of Driven Piles in Calcareous Sands, 453

Driver behavior

Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036

Droughts

Characteristics and Spatial Variability of Droughts in Idaho, 666
 Hale Cycle and Indian Drought and Flood Area Indexes, 682

Hydraulic Engineering: Global Challenge, 599
 Simulation Models of Sequences of Dry and Wet Days, 684

Use of Stochastic Hydrology in Reservoir Operation, 683

Ductility

Abutment Pile Design for Jointless Bridges, 960
 Analytical Study for Concrete Confinement in Tied Columns, 954
 Assessment of Seismic Structural Damage, 916
 Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
 Composite Action in Eccentrically Braced Frames, 909
 Connections Between Precast Elements—Failure Within Connection Region, 976
 Cyclic Tests of Full-Scale Composite Joint Subassemblies, 905
 Experimental Behavior of Dual Steel System, 796
 Inelastic Buckling of Reinforcing Bars, 262
 Inelastic Torsional Response of a Single Story Framed Structure, 373
 Modification of Behavior of Double-Layer Grids: Overview, 847
 Seismic Failure Rates of Multistory Frames, 802
 Size Effects on Strength, Toughness and Ductility, 347

Ducts

Power Without Acid, 1237

Dunes

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

Dye studies

Measurement of Upwelling Flow from Air Diffuser,

220

Dynamic analysis

Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110
 Boundary Element Methods in Structural Analysis, 1302
 Dynamic Response Verification of Simplified Bridge-Foundation Model, 460
 Dynamic Synthesis of Nonclassically Damped Substructures, 265
 Estimation of the Inelastic Longitudinal Abutment Stiffness of Bridges, 928
 Impact Load Distribution in Concrete Bridge Ties, 816
 Lessons from Explosive Tests on RC Buried Arches, 833
 Space Station Structure Modal Selection Criteria, 23
 Validity of Smith Model in Pile Driving Analysis, 517

Dynamic characteristics

Uncertainties in Establishing Design Earthquakes, 5

Dynamic loads

Modeling Dynamic Occupant Loads, 875
 Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Dynamic models

Dynamic Model of Nitrification in a Fluidized Bed, 195
 Modeling of Dynamic Systems: An Innovative Approach, 111
 New Formulation for Vibration Analysis, 296

Dynamic programming

Aqueduct and Reservoir Capacities for Distribution Systems, 1106
 DYN² Method for Optimal Control of Water Flow in Open Channels, 728
 Dynamic Probabilistic Decision Processes, 74
 Implementation Strategies for Salinity Projects, 1114
 Improving Water Delivery System Operation Using Training Simulators, 1110
 Methodology for Improving Pump Operation Efficiency, 1081
 On Least-Cost Design of Aqueduct Systems, 1102
 Optimal Operation of Water Distribution Systems, 1118
 Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095

Dynamic response

Antiplane Earthquake Waves in Long Structures, 428
 Characteristics of Response to Nonstationary White Noise: Theory, 380
 Characteristics of Response to Nonstationary White Noise: Applications, 381
 Cyclic Load Behavior of Bolted Timber Joint, 935
 Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378
 Dynamic Triaxial Tests of High-Strength Concrete, 317
 Dynamics and Control of Elevators with Large

Gaps and Rubber Dampers, 951
 Effect of Initial Imperfections on Dynamic Buckling of Shells, 328
 Fatigue Behavior of Composite Metal Deck Slabs, 790
 FEM Dynamic Fracture Analysis of Concrete Beams, 396
 HIBIC: Expert System for Highway Bridge Dynamics, 124
 Inelastic Torsional Response of a Single Story Framed Structure, 373
 Influence Coefficients for Dynamic Response of Foundations, 417
 Mode-Superposition Methods for Elastoplastic Systems, 400
 New Formulation for Vibration Analysis, 296
 Numerical Solution for Response of Beams With Moving Mass, 792
 PC-Based Data Acquisition System for Structural Monitoring, 123
 Pipe-Soil Interaction Model, 1137
 Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
 Seabed Stability Near Floating Structures, 1168
 Seismic Analysis of Multistory Building Systems Using Microcomputers, 101
 Seismic Interaction of Structures and Soils: Stochastic Approach, 841
 Seismic Response of Imperial County Services Building in 1979, 971
 Seismic Waves in Buildings with Shear Walls Or Central Core, 427
 Sinusoidal Forced Vibration of Sliding Masonry System, 891
 Study of Inelastic Spectra With High Damping, 871
 Torsional Response of Symmetric Structures, 277
 Wave Forces on Fixed Offshore Structures in Short-Crested Seas, 301
Dynamic stability
 Dynamic and Static Behavior of Cable Dome Model, 807
 Dynamic Stability of Thin-Walled Structural Members Under Periodic Axial Torque, 266
Dynamic structural analysis
 Analytical Modeling of Phase 2 Steel Structure, 903
 Brace Fractures and Analysis of Phase I Structure, 904
 Earthquake Response of Torsionally Coupled, Frame Buildings, 835
 Economical Analysis of Combined Dynamical Systems, 395
 Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836
 Modified Dynamic Condensation Method, 800
Dynamic tests
 Behaviors of Steel and Composite Beams at Various Displacement Rates, 910
 Coupled Vibration of Embedded Foundation, 513
 Dynamic Skin-Friction Effects on Buried Arches, 893
Dynamics
 Aerodynamic Model Tests of Tall Buildings, 300
 Analytical Solution to Free Vibration of Sector

Plates, 429
 Coupled Vibration of Embedded Foundation, 513
 Dynamics of Saturated Rocks. I: Equations of Motion, 323
 Dynamics of Saturated Rocks. II: Body Waves, 324
 Dynamics of Saturated Rocks. III: Rayleigh Waves, 325
 Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349
 Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
 Impedance Functions and Input Motions for Embedded Square Foundations, 473
 Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282
 Paradox Unresolved, 318
 Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
 Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472
 Rocking Stiffness of Arbitrarily-Shaped Embedded Foundations, 471
 Scheme to Improve Numerical Analysis of Hysteretic Dynamic Systems, 799
 Steady State Vibration of Subway-Soil-Building System, 270
 Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963
 Wave Forces on Fixed Offshore Structures in Short-Crested Seas, 301
 Wind Response Spectrum, 390
Earth pressure
 Arch in Soil Arching, 469
 Geostatic Wall Pressures, 519
Earth reinforcement
 Deformation Characteristics of Reinforced Sand in Direct Shear, 509
 Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497
 Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503
 Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470
Earthfill
 Collapse of Compacted Clayey Sand, 515
Earthmoving
 Truck Capacity Selection for Earthmoving, 72
Earthquake damage
 Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917
 Seismic Response of Imperial County Services Building in 1979, 971
Earthquake engineering
 Active Optimal Control of Structure Using Optimal Observer, 421
 Analytical Modeling of Phase 2 Steel Structure, 903
 Assessment of Seismic Structural Damage, 916
 Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
 Cyclic Behavior of Double Angle Connections, 852
 Dynamic Response Verification of Simplified Bridge-Foundation Model, 460

Experimental Behavior of Dual Steel System, 796
 Experimental Study of Active Control for MDOF Seismic Structures, 363
 The Great Quake: On Site Reports, 1287
 Impedance Functions and Input Motions for Embedded Square Foundations, 473
 Interior Joints with Variable Anchorage Lengths, 921
 Isolated Examples, 1284
 Seismic Behavior of Concentrically Braced Frame, 897
 Seismic Codes: Preparing for the Unknown, 1285
 Seismic Engineering: Research and Practice, 1332
 Shaking Table Tests of Pinned-Based Steel Gable Frame, 967
 Small-Scale Model Tests of Structural Steel Assemblies, 906
 Wind Response Spectrum, 390

Earthquake excitation
 Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412
 Comparative Study of Base Isolation Systems, 385
 Hysteretic Column Under Earthquake Excitations, 264

Earthquake loads
 Earthquake Load for Structural Reliability, 873

Earthquake magnitude scale
 Geologic Characterization of Seismic Sources, Moving into the 1990s, 3

Earthquake prediction
 Geologic Characterization of Seismic Sources, Moving into the 1990s, 3

Earthquake resistant structures
 1990: Decade of Natural Disaster Reduction, 1294
 Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
 Brace Fractures and Analysis of Phase I Structure, 904
 Earthquake Response of Torsionally Coupled, Frame Buildings, 835
 The Great Quake: On Site Reports, 1287
 Isolated Examples, 1284
 Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836
 Quasi-Static Tests of Scaled Model Building, 900
 Seismic Engineering: Research and Practice, 1332
 Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Earthquakes
 Analytical Evaluation of K-Braced Structure Seismic Test, 902
 Antiplane Earthquake Waves in Long Structures, 428
 Assessment of Seismic Structural Damage, 916
 Centrifuge Study of Faulting Effects on Tunnel, 499
 Connections Between Precast Elements—Failure Within Connection Region, 976
 CSTRUCT: Computer Environment for Design of Steel Structures, 115
 Cyclic Tests of Full-Scale Composite Joint Subassemblies, 905

Dynamic Synthesis of Nonclassically Damped Substructures, 265
 Earthquake Response of Torsionally Coupled, Frame Buildings, 835
 Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349
 The Great Quake: On Site Reports, 1287
 Impact of Earthquakes on Cantilever Retaining Walls, 939
 Inelastic Torsional Response of a Single Story Framed Structure, 373
 Influence of Cementation on Liquefaction of Sands, 507
 In-Plane Vibrations of X-Braced Frames, 410
 Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836
 Modified Frequency-Domain Data Processing, 408
 Nonlinear Seismic Analysis of Arch Dams, 310
 Pseudodynamic Test Method—Current Status and Future Directions, 913
 Recursive Optimization for Seismic Steel Frames, 812
 Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
 Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
 Seismic Analysis of Multistory Building Systems Using Microcomputers, 101
 Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901
 Seismic Engineering: Research and Practice, 1332
 Seismic Response of Imperial County Services Building in 1979, 971
 Seismic Risk Analysis of Buried Pipelines, 1031
 Seismic Waves in Buildings with Shear Walls Or Central Core, 427
 Selected Papers from Chinese Journals of Structural Engineering, 1333
 Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12
 Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11
 Simplified Evaluation of Added Hydrodynamic Mass for Intake Towers, 348
 Sinusoidal Forced Vibration of Sliding Masonry System, 891
 Study of Inelastic Spectra With High Damping, 871
 Uncertainties in Establishing Design Earthquakes, 5
 Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Earthwork
 Direct Land Grading Design of Irrigation Plane Surfaces, 680
 New Basis for Earthwork Specification for Clay Soil, 537
 Three-Point Method for Estimating Cut and Fill Volumes of Land Grading, 695

Eccentric bracing
 Analytical Modeling of Phase 2 Steel Structure, 903
 Composite Action in Eccentrically Braced Frames, 909
 Experimental Behavior of Dual Steel System, 796

Quasi-Static Tests of Scaled Model Building, 900
 Seismic Behavior of Eccentrically Braced Steel Building, 898
Eccentric loading
 Behavior of Rolled Section Web Under Eccentric Edge Compressive Loads, 880
Eccentric loads
 Behavior of Rolled Section Web Under Eccentric Edge Compressive Loads, 880
 Eccentrically-Obliquely Loaded Footing, 542
 Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
Economic analysis
 Aqueduct and Reservoir Capacities for Distribution Systems, 1106
 Breakwater Choices, 1243
 Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034
 Economic Impact of Micro Catchment Development, 700
 Evaluation of Irrigation Planning Decisions, 663
 Predesign Planning for Parking Facilities, 759
 Production, Cost, and Increased Salinity in Water, 1123
 Required Return on Investments in Construction, 66
Economic conditions
 Managing Change in the Midst of Economic Uncertainty, 750
Economic development
 Alaska's Infrastructure and Limits to Growth, 127
Economic factors
 Problems of Housing in Kuwait, 1067
 Production, Cost, and Increased Salinity in Water, 1123
Economic feasibility
 Fracture Mechanics Analysis of High-Strength Concrete, 782
 Implementation Strategies for Salinity Projects, 1114
Economic impact
 Economic Impact of Micro Catchment Development, 700
 Impact Analyses of Construction of Kansai International Airport, 1062
 Making Amends with Nature, 1217
 Mitigation of Damages to Electric Utilities Due to High Winds, 28
Economics
 Capital Cost and Operations of High-Speed Rail System in West Germany, 1019
 Geothermal Energy Applications in Wastewater Treatment, 129
 Information Systems and the Economics of Engineering Services, 737
 Problems of Housing in Kuwait, 1067
Ecosystems
 Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192
Eddy viscosity

Bottom Boundary Layer Under Nonlinear Wave Motion, 1127
Education
 Civil Engineering Design Professors Should be Registered Engineers, 240
 Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250
 Education—Key to Dealing with Social and Environmental Objectives, 1073
 Future of Civil Engineering Profession and Role of Education, 229
 Training the Waste Watchers, 1254
Effective length
 Effective Length Factor for Columns in Unbraced Frames, 794
 Effective Length Spectra for Cross Bracings, 972
Effective stress
 Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418
Effective stresses
 Nonlinear Failure Envelope for Soils, 479
Effective width
 Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
Efficiency
 Cavitation Erosion in Hydroturbines, 626
 Efficiency of Detachable Platforms in the Arctic, 128
 What's Wrong With Superfund, 1204
Effluents
 Dynamic Model of Nitrification in a Fluidized Bed, 195
 Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692
 Odors: The Other Effluent, 1244
Eigenvalues
 Buckling Analysis of Segmented Conical Concrete Shell Roof, 877
 Buckling Loads of Columns with Varying Cross Sections, 303
 Eigenproperties of Classically Damped MDOF Composite Systems, 356
 Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
 Lower Bounds for Eigenvalues via Rayleigh's Method, 346
 Modal Identification of Vibrating Structures Using ARMA Model, 402
Eigenvectors
 Modal Identification of Vibrating Structures Using ARMA Model, 402
Elastic analysis
 Boundary Element Methods in Structural Analysis, 1302
 Circular Plate Analysis by Finite Differences: Energy Approach, 337
 Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038
 Elastic and Plastic Designs for Maximum Load, 866
 Elastic Stiffness of Flat Anchor Region at Cracked Geological Interface, 263

Seismic Behavior of Concentrically Braced Frame, 897

Elastic deformation

Method for Solving Inverse Elastoviscoplastic Problems, 401

Scheme for Elasticas with Snap-Back and Looping, 398

Shakedown Analysis in Plastic Design of Steel Structures, 281

Elastic foundations

Beam-Column Element on Weak Winkler Foundation, 374

Reciprocal Conjugate Method for Space Curved Bars, 818

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Elastic properties

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969

Further Studies on Elastic Properties of Douglas Fir, 770

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Stability Functions for Three-Dimensional Beam-Columns, 813

Strain Increment and Stress Directions in Torsion Shear Tests, 524

Elastic restraints

Lateral Buckling in Curtain Wall Systems, 934

Elastica

Scheme for Elasticas with Snap-Back and Looping, 398

Elasticity

Approximate Analysis of Twisted Parallelepiped, 275

Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378

Dynamics of Saturated Rocks. I: Equations of Motion, 323

Dynamics of Saturated Rocks. II: Body Waves, 324

Elasticity of Particulate Materials, 490

Finite Element Analysis of Some Inverse Elasticity Problems, 342

Frictional Punch and Crack in Plane Elasticity, 333

Model of Finite Strain Creep of Metals, 353

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Post-Buckling Analysis of Steel Space Trusses, 839

A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338

Small-Scale Model Tests of Structural Steel Assemblies, 906

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334

Stress Interference in a Transversely Isotropic Body

Under Axisymmetric Loading, 297

Stress, Vibration and Buckling of Multilayered Cylinders, 789

Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Elastomer

Analytical Parameter Study for Class of Elastomeric Bearings, 930

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803

Elastoplasticity

Application of Orthotropic Failure Criterion to Wood, 316

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Finite Element Model for RHS Double Chord K-Joints, 848

Incremental Resistance and Deformations of Elastoplastic Beams, 861

Mode-Superposition Methods for Elastoplastic Systems, 400

Shakedown of Grids Under Combined Bending and Torsion, 961

Validity of Smith Model in Pile Driving Analysis, 517

Electric power demand

A Capacity Expansion Model for Hydrothermal Power Systems, 1082

Electric power plants

Electricity From Air, 1239

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Electric power transmission

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Electrification

Active Control of Flexural Vibrations in Beams, 33

Elevated structures

Rebuilding Philadelphia's El, 1187

Elevation

Fundamentals of GPS Baseline and Height Determinations, 996

Wave-Tubular Member—Wave and Current Interaction, 1170

Elevators

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Embankment stability

Design Problems in Soil Liquefaction, 17

Stability Analysis of Embankments on Soft Ground, 458

Embankments

Construction and Performance of Two Large Rockfill Embankments, 544

Geotechnical Input to a Major Bridge Project, 464

High-Rise Embankments, 1267

Mechanics of Overflow Erosion on Embankments: Part I—Research Activities, 612

Mechanics of Overflow Erosion on Embankments
Part II. Hydraulic and Design Considerations,
613

Properties of Solid Waste Incinerator Fly Ash, 508
Stability Analysis of Embankments on Soft
Ground, 458

Test Embankment Dam of Fracture Grouting, 541

Embedded foundations

Coupled Vibration of Embedded Foundation, 513
Rocking Stiffness of Arbitrarily-Shaped Embedded
Foundations, 471

Embedment

Finite Element Model for Curved Embedded
Reinforcement, 308
Soil Resistances to Embedded Anchor Chain in
Soft Clay, 526
Torsional Response of Symmetric Structures, 277
Vertical Vibration of Machine Foundations, 449

Emission control

Selection of Receptor Sites for Optimized Acid
Rain Control Strategies, 203

Employee relations

Management/Employee Ethics in Engineering Of-
fices, 228

Employment conditions

Project-Labor Agreements in Construction Indus-
try, 97

Energy

Center-Pivot End Gun Irrigation Cost Analysis, 722
Seismic Behavior of Concentrically Braced Frame,
897

Systems Analysis of Tank Irrigation: I. Crop
Staggering, 687

Systems Analysis of Tank Irrigation: II. Delayed
Start and Water Deficit, 688

Energy absorption

Earthquake Load for Structural Reliability, 873
Validity of Smith Model in Pile Driving Analysis,
517

Energy conversion

Compendium of International Ocean Energy Ac-
tivities, 1309
Electricity From Air, 1239

Energy development

Global Changes and New Challenges for Civil
Engineers, 226

Energy dissipation

Composite Action in Eccentrically Braced Frames,
909

Connections Between Precast Elements—Failure
Within Connection Region, 976

Cyclic Tests of Full-Scale Composite Joint Sub-
assemblages, 905

Energy sources

Unconventional Power Sources for Ice Control at
Locks and Dams, 133
Waterpower '89, 1344

Energy transfer

Energy Transfer Mechanism in SPT, 521

Engineering

Engineering Applications of GPS Differential
Surveying, 1006

Guide for Evaluating Engineering Software, 1320

Limitations in Decision Making and System Per-
formance, 45

Engineering education

Attracting Today's Youth to Civil Engineering, 251

Automation of Civil Engineers: Some Observations,
758

Curriculum for Future Civil Engineers: Practi-
tioner's Viewpoint, 250

Designing the Design Engineer, 243

Engineering 21st Century Highways, 1315

Finding and Keeping Technical Experts in the
1990s, 738

First, Second, and Third Thoughts on Civil Engi-
neering Education, 231

Future of Civil Engineering Profession and Role of
Education, 229

Improving Management of Technology, 760

Microcomputer Applications in Simulated CE
Project, 757

Quality Undergraduate Engineering Education—A
Critical Perspective, 241

Solving Low Enrollment Problems in Civil Engi-
neering, 242

Training Expatriate Engineering Professionals, 755

University Programs in Computer-Aided Engi-
neering, Design, and Manufacturing, 1341

Engineering firms

Business Planning for New Engineering Consulting
Firms, 742

Establishing, Operating, and Controlling an Engi-
neering Consulting Firm, 235

Setting Sights on Safety, 1177

Engineering mechanics

Lower Bounds for Eigenvalues via Rayleigh's
Method, 346

Engineering profession

Actions Necessary to Make Civil Engineering More
Attractive to High-Quality High School Students,
237

Continuing Education for Engineers: University's
Role, 255

Does Ethical Engineering Practice Affect Creativ-
ity?, 4

The Elusive Engineering Style, 257

Finding and Keeping Technical Experts in the
1990s, 738

Future of Civil Engineering Profession and Role of
Education, 229

Impact of Professional Practice Standards on
Liability of Engineers, 754

Engineering services

Information Systems and the Economics of Engi-
neering Services, 737

Engineers

Cautious Risk Taking, 1271

Continuing Education for Engineers: University's
Role, 255

The Elusive Engineering Style, 257

Engineers Legislative Alliance of Wisconsin

- (ELAW), 256
- The Long Arm of Liability, 1265
- Our Most Important Resource: People, 751
- Peer Review in the Public Sector, 223
- The Program Manager: Mind Over Machine, 1224
- Role of Private Sector Finance, 224
- What is an "Ethical" Engineer?, 763
- Which Comes First—Responsibility or Liability?, 260

Entrainment

- Entrainment by Buoyant Jet Between Confined Walls, 578
- Hydraulic Jump as "Mixing Layer", 647
- Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576
- Sediment Entrainment and Deposition Measurements in Long Island Sound, 8
- Surface Thermal Plume in Channel, 600

Entropy

- Entropy Model for Consistent Impact-Fee Assessment, 1063
- Velocity Distribution in Open Channel Flow, 585

Envelope curves

- Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161
- Model for Response of Concrete To Random Compressive Loads, 953
- Wave Envelope and Related Spectra, 1157

Environment

- Building A Better Wetland, 1245
- Environmental Engineering, 1316
- Environmental Engineering Infrastructure: Problems and Needs, 225
- Hydraulic Engineering: Global Challenge, 599
- Post-Audits of Environmental Programs and Projects, 1326

Environmental effects

- Factors Affecting Construction Planning Efforts, 64
- Hydro on Hold, 1248
- Impact Evaluation Procedures: Theory, Practice, and Needs, 1070
- Influence of Vessel Movements on Stability of Restricted Channels, 1153
- Multicriterion Analysis of Hydropower Operation, 445
- Structural Materials, 1336

Environmental engineering

- Assessing Site Assessments, 1273
- Cold Regions Environmental Engineering: Tomorrow's Challenges, 135
- Environmental Engineering, 1316
- Environmental Engineering Infrastructure: Problems and Needs, 225
- Tapping A Glacier, 1235
- Use of Geotextiles and Geocomposites in the United Kingdom, 75

Environmental factors

- Hydro on Hold, 1248

Environmental impact

- Noise and Air Pollution of High Speed Rail

- Systems, 1016

Environmental impacts

- Bridge Design and the "Bridge Aesthetics Bibliography", 838
- Irrigation-Induced Contamination: How Real a Problem?, 658
- Lake Michigan Diversion and Illinois Waterways, 1140
- Making Amends with Nature, 1217
- Post-Audit Study of Dieldrin Bioconcentration Model, 181
- Reclamation of Exxon Ray Point Tailings Basin, 444
- Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
- Tapping A Glacier, 1235
- Top Projects for 1989, 1240
- Waste Facility Impacts on Residential Property Values, 1064
- Waterpower '89, 1344

Environmental issues

- Augering Answers, 1289
- Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303
- Cold Regions Engineering, 1308
- Critical Issues in Safe Transport of Hazardous Materials, 1055
- Education—Key to Dealing with Social and Environmental Objectives, 1073
- Energy from the Amazon, 1291
- Hydro on Hold, 1248
- Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323

Environmental planning

- Building A Better Wetland, 1245
- Cold Regions Environmental Engineering: Tomorrow's Challenges, 135
- Energy from the Amazon, 1291
- Environmental Engineering, 1316
- Making Amends with Nature, 1217
- Technology, Society, and Water Management, 1074
- Environmental Protection Agency**
- The Asbestos Agenda, 1266
- Suburban Superfund, 1206
- What's Wrong With Superfund, 1204

Environmental quality

- Cold Regions Environmental Engineering: Tomorrow's Challenges, 135
- Environmental Engineering, 1316
- Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072
- Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203
- Top Projects for 1989, 1240

Ephemeral streams

- Simulating Effect of Channel Changes on Stream Infiltration, 649

Epoxy resins

- Durability of Posted and Epoxy-Grouted Timber Piles, 834

Equations of motion

Friction Factors for Small Diameter Plastic Pipes, 560

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394

Equations of state

Models of Sorptive Toxic Substances in Freshwater Systems. I. Basic Equations, 13

Equilibrium profile

Rubble-Mound Breakwaters with S-Shape Design, 1160

Equipment

Equipment Policy of Top 400 Contractors: A Survey, 79

Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278

GPS Antenna Set-Up Procedures and Error Sources, 1002

Low-Stress Dilation Test, 489

Equivalence

Continuum Models of Space Station Structures, 40

Equivalent Systems for Variable Thickness Plates, 405

Erosion

Barrier Islands: Process and Management, 1301

Cavitation Erosion in Hydroturbines, 626

Coastlines of Brazil, 1305

Coastlines of Italy, 1306

Critical Filters for Impervious Soils, 498

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Evaluation of Navigation Dam Effects on Riverbanks, 1149

Experimental p - y Model for Submerged Stiff Clay, 451

Guide for Estimating Riverbed Degradation, 571

Hydrologic Approach to Prediction of Sediment Yield, 581

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Mathematical Modeling of Fluvial Sand Delivery, 1144

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations, 613

Pumping Prediction Model for Highway Concrete Pavements, 1026

Reclamation of Exxon Ray Point Tailings Basin, 444

Response of Marine Pipelines in Scour Trenches, 1155

Riprap Protection Without Filter Layers, 648

Scour-Depth Prediction Under Armoring Conditions, 633

Erosion control

1990: Decade of Natural Disaster Reduction, 1294

Applications of Headland Control, 1143

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments

Part II. Hydraulic and Design Considerations, 613

Reclamation of Exxon Ray Point Tailings Basin, 444

Riprap Design, 604

Use of Geotextiles and Geocomposites in the United Kingdom, 75

Error analysis

Dilution Discharge Measurement during Flood Wave, 645

Error Estimation for Boundary Element Analysis, 386

Error in Variables Parameter Estimation, 156

Measuring Design and Construction Quality Costs, 83

Modeling Mixed Sediment Suspended Load Profiles, 594

Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112

Prediction of Sediment Sampling Error at Nozzle, 653

Errors

Checking Models in Structural Design, 864

Error Estimation for Boundary Element Analysis, 386

Experiment Design Approach to Nondestructive Testing of Pavements, 1049

GPS Antenna Set-Up Procedures and Error Sources, 1002

Human Error in Structural Design Tasks, 895

Limitations in Decision Making and System Performance, 45

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Modified Frequency-Domain Data Processing, 408

Optimization of Structural Design Checking, 932

Esthetics

Bridge Design and the "Bridge Aesthetics Bibliography", 838

Estimating

Cost-Estimating Principles, 95

Estimating Pit Excavation Volume Using Unequal Intervals, 1011

Time-Cost Trade-off Among Related Activities, 90

Estimation

Accuracy of Estimated Reference Crop Evapotranspiration, 730

Error in Variables Parameter Estimation, 156

GOES Satellite Data in Rainfall Estimation, 721

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Probabilistic Potentiometric Surface Mapping, 535

River Quality Modeling: Time Domain Approach, 707

Three-Point Method for Estimating Cut and Fill Volumes of Land Grading, 695

Estuaries

Decision Support for Estuarine Water Quality Management, 1120

Estimating Estuarine Reaeration Rates, 205

Interfacial Stability in Stratified Channel Flows, 619

Internal Lee Waves in Turbulent Two-Layer Flow, 629

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577

Ethics

Does Ethical Engineering Practice Affect Creativity?, 4

Management/Employee Ethics in Engineering Offices, 228

Our Most Important Resource: People, 751

What is an "Ethical" Engineer?, 763

Which Comes First—Responsibility or Liability?, 260

Europe

Geosynthetic Shields For Dams, 1181

Hydro on Hold, 1248

The Race for Smart Cars, 1279

Eutrophication

Approximate Dynamic Lake Phosphorus Budget Models, 190

Impact of Land Use and NPS Loads on Lake Quality, 179

Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098

Evaluation

Analyzing in 3D, 1196

Assessment: U.S. Office Building in Moscow, 41

Automation of Civil Engineers: Some Observations, 758

Calibration of Bridge-Strength Evaluation Code, 879

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Freeway Surveillance and Control System Using Simulation Model, 1043

GPS Processing Methods: Comparison with Precise Trilateration, 992

Guide for Evaluating Engineering Software, 1320

HSR Vehicle Performance Characteristics, 1018

Impact Evaluation Procedures: Theory, Practice, and Needs, 1070

Microcomputers: Investing in the Future, 1231

Post-Audits of Environmental Programs and Projects, 1326

Public Agency Peer Review: Case Study, 222

Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487

Shopping for Better Project Management, 1175

Unbonded Performance, 1275

Evaporation

Accuracy of Estimated Reference Crop Evapotranspiration, 730

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

Nonisothermal Consolidation in Unsaturated Soil, 522

Prediction of Class A Pan Evaporation in Southwest Idaho, 671

Research Imperatives for Irrigation Science, 689

Evapotranspiration

Accuracy of Estimated Reference Crop Evapotranspiration, 730

Improved Approach to Irrigation Scheduling Programs, 701

Management Model for Control of On-Farm Irrigation, 727

Modeling Yields from Rainfall and Supplemental Irrigation, 677

Solute Movement Through Root-Soil Environment, 703

Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343

Evolution, development

An Education in Tunneling, 1202

An Education in Tunneling, 1208

Examination

Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246

Excavation

Augering Answers, 1289

Building Response to Excavation-Induced Settlement, 446

Estimating Pit Excavation Volume Using Unequal Intervals, 1011

Lateral Wall Deflections of Braced Excavations in Clay, 494

Saturated Clay Response During Braced Cut Construction, 505

Tunnel Talk, 1288

Excitation

Equivalent Linearization Method in Nonlinear FEM, 292

Modal Identification of Vibrating Structures Using ARMA Model, 402

Expansion

Alternate Analysis of Pressuremeter Test, 548

A Capacity Expansion Model for Hydrothermal Power Systems, 1082

Cementation Effects in Frictional Materials, 523

Low-Stress Dilation Test, 489

Expansion joints

Bridge Retrofit Testing: Hinge Cable Restraints, 840

Expansive clays

Laboratory Evaluation of Lateral Swelling Pressure, 529

Experimental data

Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465

Free-Surface Flow Produced by Accelerating Vertical Cylinder, 359

Experimental design

Bearing Capacity of Footings Adjacent to Slopes, 477

Experimentation

Beam-Column Moment Connections for Composite Frames: Part I, 957

Behavior of Thin-Walled Steel Box Columns Under

SUBJECT INDEX

Failures

- Biaxial Loading, 970
- Experimental Study of Active Control for MDOF Seismic Structures, 363
- Experimental Study of Prestressed Composite Beams, 926
- Lateral Pile Interaction Factors in Submerged Sand, 466
- Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640
- Simulation of Wind-Induced Water Currents, 616
- Expert systems**
- Automated Design of Wastewater Plants, 1228
- Computer Utilization in Structural Engineering, 1310
- Computerized Decision Support Systems for Water Managers, 1311
- Computing in Civil Engineering: Computers in Engineering Practice, 1312
- Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100
- Expert System for Calibrating SWMM, 1089
- Expert System for Evaluating and Notifying Hazardous Waste Generators, 108
- Expert Systems as Construction Management Tools, 745
- HIBIC: Expert System for Highway Bridge Dynamics, 124
- Intelligent Decision Support and Reservoir Management and Operations, 125
- Knowledge-Based Standard-Independent Member Design, 870
- Knowledge-Based System for Soil Improvement, 118
- Statistics-Based Approach to Wastewater Treatment Plant Operations, 180
- Expert witness**
- Guidelines for Failure Investigation, 1321
- Explosives**
- Lessons from Explosive Tests on RC Buried Arches, 833
- Extraction procedures**
- Applying Groundwater Flow Models in Vapor Extraction System Design, 149
- Mathematical Modeling of Landfill Gas Extraction, 206
- Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187
- Fabrics**
- Crack Control in Beams Using Deformed Wire Fabric, 945
- Fold and Bond Construction of Cement Laminated Structural Shapes, 779
- Low-Stress Dilation Test, 489
- Nondestructive Load Predictions of Concrete Shell Buckling, 857
- Facilities**
- Facilities Management With CADD, 1232
- Remote Oil and Gas Facility Construction, 73
- Failure**
- Failure of Concrete Pavements in Test Tracks, 1048
- Failure load**
- Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970
- Failure mode**
- Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780
- Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536
- Failure modes**
- Small-Scale Model Tests of Structural Steel Assemblies, 906
- Structural System Reliability Using Linear Programming and Simulation, 931
- Welded-Tee End Connections for Circular Hollow Tubes, 975
- Failure surface**
- Cementation Effects in Frictional Materials, 523
- Failures**
- Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823
- Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022
- Behavior of Brick Masonry Under Cyclic Compressive Loading, 872
- Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59
- Communications Failure in Hyatt Regency Disaster, 245
- Concrete Degradation Due to Thermal Incompatibility of Its Components, 777
- Constitutive Equations for Concrete in Failure State, 362
- Cyclic Load Behavior of Bolted Timber Joint, 935
- Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780
- Grouting Trends, 1274
- Limitations in Decision Making and System Performance, 45
- Model of Finite Strain Creep of Metals, 353
- Necessary Redundancy in Geotechnical Engineering, 532
- Parametric Sensitivity in First Order Reliability Theory, 361
- Plastic Reliability Analysis by Directional Simulation, 345
- Post-Buckling Analysis of Steel Space Trusses, 839
- Project Peer Review: Results of the Structural Failures II Conference, 56
- Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503
- Reliability Analysis of the Mohr Failure Criterion, 290
- Search for the Cause of High-Speed-Channel Revetment Failures, 50
- Seismic Response of Imperial County Services Building in 1979, 971
- Sensitive Strata in Bootlegger Cove Formation, 514
- Simulation of Cracking in Large Arch Dam: Part I, 882
- Simulation of Cracking in Large Arch Dam: Part II, 883
- Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384
- Strain Increment and Stress Directions in Torsion

- Shear Tests, 524
- Strength and Deformability of Steel Column Footing, 911
- Two Roof Failures Due to Water Ponding and Related Code Requirements, 53
- Which Comes First—Responsibility or Liability?, 260
- Wind Damage to Masonry Buildings, 37
- Wind Design Problems with Building Structures During Construction, 29
- Failures, Investigations**
 - Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
 - Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022
 - Ashland Tank Collapse Investigation, 51
 - The Great Quake: On Site Reports, 1287
 - Guidelines for Failure Investigation, 1321
 - Mediation that Worked: Role of OSHA in L'Am-biance Plaza Settlement, 55
- Farm management**
 - Down on the Farm, 1198
- Farms**
 - Aqueduct and Reservoir Capacities for Distribution Systems, 1106
 - Down on the Farm, 1198
- Fast track construction**
 - Fast Track, Instant Track, 1268
- Fasteners**
 - Cyclic Load Behavior of Bolted Timber Joint, 935
 - Finite Element Modeling of Wood Diaphragms, 817
- Fatigue**
 - Assessment of Seismic Structural Damage, 916
 - Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038
 - Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964
 - Structural Materials, 1336
 - Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810
- Fatigue life**
 - Effect of Length on Fatigue Life of Long Thin Continuous Components, 351
- Fatigue, materials**
 - Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892
- Fatigue tests**
 - Cyclic Load Behavior of Bolted Timber Joint, 935
- Feasibility studies**
 - Irrigation and Drainage Strategies in Salinity-Affected Regions, 679
 - Potential Robotics Utilization in Construction, 67
 - Predesign Planning for Parking Facilities, 759
- Federal government**
 - Assessment: U.S. Office Building in Moscow, 41
 - Brick Masonry: U.S. Office Building in Moscow, 43
 - History and Method of Indian Allotment Surveys, 1008

- Progressive Collapse: U.S. Office Building in Moscow, 44
- Structure: U.S. Office Building in Moscow, 42
- Federal-state cooperation**
 - Mediation that Worked: Role of OSHA in L'Am-biance Plaza Settlement, 55
- Federal-state relationships**
 - New Federalism and Social and Environmental Goals, 1071
- Feedback control**
 - Active Control of Flexural Vibrations in Beams, 33
- Feedback loops**
 - Post-Audits of Environmental Programs and Pro-jects, 1326
- Fees**
 - Entropy Model for Consistent Impact-Fee As-sessment, 1063
 - Fee Vs. Quality, 230
 - Fees Versus Quality, 244
 - Impact Fee Program for Fulton County, Georgia, 1061
- Fertilizers**
 - Irrigated Agriculture and Water Quality in South, 718
- Fiber composites**
 - Marine Curing of Steel Fiber Composites, 775
 - Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413
- Fiber reinforced materials**
 - Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413
- Fibers**
 - Marine Curing of Steel Fiber Composites, 775
- Field investigations**
 - Cavitation Erosion in Hydroturbines, 626
 - Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59
- Field tests**
 - Deer Isle Bridge: Efficacy of Stiffening Systems, 923
 - Deer Isle Bridge: Field and Computed Vibrations, 924
 - Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950
 - Detecting the Defects, 1263
 - Effects of Deficit Irrigation and Irrigation Fre-quency on Wheat Yields, 672
 - Energy Transfer Mechanism in SPT, 521
 - Failure of Concrete Pavements in Test Tracks, 1048
 - Field Performance of Structural Slurry Wall, 454
 - Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536
 - Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194
 - In Situ Hydraulic Conductivity Tests for Com-pacted Clay, 512
 - Measurement of Upwelling Flow from Air Diffuser, 220

SUBJECT INDEX

Finite element method

Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608

Observed Performance of a Deep Excavation in Clay, 504

Optimal Scheduling of Irrigation Machines: II—Applications and Results, 724

River-Meander Model: II. Applications, 636

Saturated Clay Response During Braced Cut Construction, 505

Skin Friction of Driven Piles in Calcareous Sands, 453

Thermal Instability in Buried Cable Backfills, 448

Upgrading Footings in Sand with Bored Piles, 546

Fills

Density Tests Above Zero Air Voids Line, 502

Diatomaceous Soils: A New Approach, 1191

Relative Compaction of Fill Having Oversize Particles, 530

Filter fabric

Power Without Acid, 1237

Filters

Breakthrough Curves in Granular Media Filtration, 188

Critical Filters for Impervious Soils, 498

Effect of Solids Property on Rates of Solids Dislodgment, 141

Filtration of Broadly Graded Cohesionless Soils, 547

Harmonic Mean Conductivity in Declining Rate Filters, 169

Improved Filter Criterion for Cohesionless Soils, 450

Investigation of Crushed Rock Filters for Dam Embankment, 468

Modeling Phosphorus Transport in Grass Buffer Strips, 165

Particle Filtration for Wastewater Irrigation, 693

Riprap Protection Without Filter Layers, 648

Filtration

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Breakthrough Curves in Granular Media Filtration, 188

Direct Filtration of *Chlorella* with Cationic Polymer, 161

Filtration of Broadly Graded Cohesionless Soils, 547

Harmonic Mean Conductivity in Declining Rate Filters, 169

Membrane Filtration of Coagulated Suspensions, 142

Particle Filtration for Wastewater Irrigation, 693

Finance

Regionalization in Water Supply Industry: Status and Needs, 1094

Financial analysis

Predesign Planning for Parking Facilities, 759

Financial management

Ensuring Your Project Managers' 'Buy-In' to Your Project Management System, 736

Financial responsibility

Suburban Superfund, 1206

Financing

Contractor Financing, Public Works in Saudi Arabia, 60

Entropy Model for Consistent Impact-Fee Assessment, 1063

Financing Urban Transportation, 1186

Impact Fee Program for Fulton County, Georgia, 1061

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

New Federalism and Social and Environmental Goals, 1071

New Frontiers in Civil Engineering: Infrastructure, 254

Role of Private Sector Finance, 224

Finegrained soils

Injection of Fine Sands with Very Fine Cement Grout, 545

Finite difference method

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Modeling of Unsteady Flow in Curved Channel, 638

Finite difference model

Limitations of de Saint Venant Equations in Dam-Break Analysis, 605

Finite differences

Circular Plate Analysis by Finite Differences: Energy Approach, 337

Pressure Distribution in Radial Flow Between Disks, 274

Finite element method

Analysis of Continuous, Haunched Box-Girder Bridges by Finite Strips, 850

Analysis of R/C Panels Using Different Concrete Models, 298

Analytical Study for Concrete Confinement in Tied Columns, 954

Analytical Study on Deformation of Fresh Concrete, 293

Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110

Automatic Generation of Seepage Flow Nets by Finite Element Method, 119

Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539

Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426

Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783

Continuum Damage Theory—Application to Concrete, 284

Deer Isle Bridge: Efficacy of Stiffening Systems, 923

Deer Isle Bridge: Field and Computed Vibrations, 924

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Equivalent Linearization Method in Nonlinear FEM, 292

Evaluation of Deep Pumping Tests, 484

Finite Element Analysis of Effect of Pipe Cooling

- in Concrete Dams, 91
- Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391
- Finite Element Analysis of Some Inverse Elasticity Problems, 342
- Finite Element Modeling of Left Ventricle, 375
- Lateral Wall Deflections of Braced Excavations in Clay, 494
- Modeling Vertically Mechanically-Laminated Lumber, 946
- Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282
- New Formulation for Vibration Analysis, 296
- Parametric Solution of Stresses in Beams, 287
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Reliability of Randomly Imperfect Beam-Columns, 403
- Response-Surface Approach for Reliability Analysis, 433
- Shape Optimal Design of Arch Dam, 929
- Simulation of Cracking in Large Arch Dam: Part I, 882
- Structural Analysis of Bimodular Materials, 322
- Structural Analysis of Bimodular Materials, 322
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843
- Validity of Smith Model in Pile Driving Analysis, 517
- Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963
- Finite element model**
- Finite Element Modeling of Wood Diaphragms, 817
- Interaction of Finite Amplitude Waves with Platforms or Docks, 1126
- Finite elements**
- Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823
- Analytical Parameter Study for Class of Elastomeric Bearings, 930
- Beam-Column Element on Weak Winkler Foundation, 374
- Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Centrifuge Study of Faulting Effects on Tunnel, 499
- Characteristics and Computational Procedure in Softening Plasticity, 364
- Curved Beam Elements for Nonlinear Analysis, 314
- Effect of Initial Imperfections on Dynamic Buckling of Shells, 328
- FEM Dynamic Fracture Analysis of Concrete Beams, 396
- Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343
- Finite Element Model for Curved Embedded Reinforcement, 308
- Finite Element Model for RHS Double Chord K-Joints, 848
- Finite Strip-Elements for Thick Plate Analysis, 335
- Method for Solving Inverse Elastoviscoplastic Problems, 401
- Post-Buckling Analysis of Steel Space Trusses, 839
- Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202
- Response-Surface Approach for Reliability Analysis, 433
- A Self-Adaptive Model for Structural Softening of Brittle Materials, 358
- Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854
- Stochastic Finite Element Expansion for Random Media, 326
- Stress, Vibration and Buckling of Multilayered Cylinders, 789
- Structural Control by Temporal Finite Elements, 35
- Finite strip method**
- Analysis of Continuous, Haunched Box-Girder Bridges by Finite Strips, 850
- Analytical Solution to Free Vibration of Sector Plates, 429
- Bending of Multi-Bin RC Cylindrical Silos, 977
- Finite Strip-Elements for Thick Plate Analysis, 335
- Reliability-Based Design of Wood Structural Systems, 886
- Fire prevention**
- Cracking the Fire Code, 1218
- Fires**
- Cracking the Fire Code, 1218
- Fish**
- Post-Audit Study of Dieldrin Bioconcentration Model, 181
- Fish habitats**
- Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108
- Storing Sediment and Freeing Fish, 1258
- Fish protection**
- Making Amends with Nature, 1217
- Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166
- Fisheries**
- Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166
- Fissures**
- Dynamics of Saturated Rocks. I: Equations of Motion, 323
- Dynamics of Saturated Rocks. II: Body Waves, 324
- Dynamics of Saturated Rocks. III: Rayleigh Waves, 325
- Fissure Parameters in Stiff Clays Under Compression, 518
- Fixed structures**
- Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38
- Seabed Stability Near Floating Structures, 1168
- Fixed-film process**
- Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184
- Flat roofs**
- Reliability-Based Design of Wood Structural Systems, 886
- Flexibility**

Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821

Flexible connections

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Flexible pavements

AASHTO Flexible Pavement Design Equation Study, 1052

Flexible pipes

Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023

Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Flexural strength

Guidelines for Flexural Design of Prestressed Composite Beams, 962

Punching in R.C. Slabs, 890

R/C Beam-Column-Slab Subassemblies Subjected to Lateral Loads, 863

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Floating body

"Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279

Floating structures

Seabed Stability Near Floating Structures, 1168

Tension Leg Platform: a State of the Art Review, 1339

Flocculation

Analytical Approach for Evaluation of Settling Column Data, 168

Breakthrough Curves in Granular Media Filtration, 188

Membrane Filtration of Coagulated Suspensions, 142

Flood control

Design of Efficient Side-Channel Spillway, 624

Water Resources Planning and Management, 1342

Flood damage

Expected Annual Damages and Uncertainties in Flood Frequency Estimation, 1078

Flood drainage

Roughness Values for Overland Flow in Subcatchments, 674

Flood forecasting

Estimating Probabilities of Extreme Rainfalls, 643

Expected Annual Damages and Uncertainties in Flood Frequency Estimation, 1078

Remote Sensing and Fully Distributed Modeling for Flood Forecasting, 1122

Storm Drain Design: Diffusive Flood Routing for PCs, 617

Flood frequency

Checking Flood Frequency Curves Using Rainfall Data, 583

Cluster Analysis as Applied to Regional Flood Frequency, 1107

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Flood plain planning

Floodplain-Management Plan Enumeration, 1101

Flood plains

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Flooding

Maximum Periodic Wave Run-up on Smooth Slopes, 1167

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations, 613

Floods

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Estimating Probabilities of Extreme Rainfalls, 643

Expected Annual Damages and Uncertainties in Flood Frequency Estimation, 1078

Hale Cycle and Indian Drought and Flood Area Indexes, 682

Hydraulic Engineering: Global Challenge, 599

Hydrodynamic Analysis of Floods in Urban System, 1105

Hydrologic Approach to Prediction of Sediment Yield, 581

Interaction of Tide and River Flow, 1130

Mathematical Modeling of Fluvial Sand Delivery, 1144

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Simulation Models of Sequences of Dry and Wet Days, 684

Floodwaves

Dilution Discharge Measurement during Flood Wave, 645

Limitations of de Saint Venant Equations in Dam-Break Analysis, 605

Floors

Fatigue Behavior of Composite Metal Deck Slabs, 790

Haunches and Hangers, 1199

Open Channel Flow Through Transverse Floor Outlets, 678

Reliability-Based Design of Wood Structural Systems, 886

Florida

Box Segmentals: Refining Design, 1270

Combined Photogeodesy and GPS Network, 990

Expressway Centerpiece, 1194

GOES Satellite Data in Rainfall Estimation, 721

Organizational Evolution I-595 Port Everglades Expressway, 81

Stabilizing a 'Mann'-Sized Sinkhole, 1290

Flow

Analytical Model for Border Irrigation, 729

Analytical Study on Deformation of Fresh Concrete, 293

Boundary Conditions for Planar Granular Flows, 341

Constitutive Equations for Concrete in Failure State, 362

Dam-Break Flows in Curved Channel, 637

Flow-Induced Vibrations of Rectangular Cylinders, 627

Free-Surface Flow Produced by Accelerating Vertical Cylinder, 359

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

Hydraulic Jump in U-Shaped Channel, 590

Mobile-Bed Friction at High Shear Stress, 598

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Slit Dam Design for Debris Flow Mitigation, 625

Stability of Frictional Materials, 376

Turbulence Characteristics of Sediment-Laden Flow, 595

Velocity Distribution in Open Channel Flow, 585

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Flow characteristics

Cluster Analysis as Applied to Regional Flood Frequency, 1107

Turbulence Characteristics of Sediment-Laden Flow, 595

Flow control

Design of Dilution Junctions for Water-Quality Control, 1124

Flow measurement

Dam-Break Flows in Curved Channel, 637

Inverted V-Notch: Practical Proportional Weir, 733

Variability of Empirical Flow Quantiles, 554

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Flow nets

Automatic Generation of Seepage Flow Nets by Finite Element Method, 119

Flow patterns

Cohesive Sediment Transport Part II: Application, 615

Flow rates

Capped Water Intakes in a Stratified Crossflow, 563

Interaction of Tide and River Flow, 1130

Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Solute Movement Through Root-Soil Environment, 703

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Flow separation

Hydraulic Jump in U-Shaped Channel, 590

Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Flow simulation

Network Flow Algorithm Applied to California Aqueduct Simulation, 1080

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Verification of Kirkham's Problem of Layered Soil Drainage, 696

Fluid dynamics

Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416

Diffusion in Gas Under Constant Pressure Drop, 383

Fluid flow

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656

Free-Surface Flow Through a Screen, 630

Transitional Flow in Channel Junctions, 564

Fluidized bed combustion

Fired Up at Fort Drum, 1200

Fluidized bed processing

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211

Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212

Fluidized bed processors

Dynamic Model of Nitrification in a Fluidized Bed, 195

Performance and Kinetics of Aerated Fluidized Bed Biofilm Reactor, 145

Fluidizing

Dynamic Model of Nitrification in a Fluidized Bed, 195

Fluid-structure interaction

Blockage Correction for Sharp-Edged Bluff Bodies, 360

Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416

Nonlinear Seismic Analysis of Arch Dams, 310

Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12

Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11

Flumes

Performance of a Wedge-Type Absorbing Wave Maker, 1125

Fly ash

A Hard Look at Concrete, 1178

Power Without Acid, 1237

Properties of Solid Waste Incinerator Fly Ash, 508

Foam

Blistering of Membranes Over Foam-Concrete Roofs, 771

Folded plates

Fold and Bond Construction of Cement Laminate Structural Shapes, 779

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Footings

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Eccentrically-Obliquely Loaded Footing, 542

Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520

SUBJECT INDEX

Framed structures

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Force

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156

Response of Marine Pipelines in Scour Trenches, 1155

Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Forced vibration

"Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279

Forecasting

Rainfall Intervention Analysis for On-Line Applications, 1096

Time Series Analysis of Water Quality Data in Pearl River, China, 176

Foreign firms

They're Coming to America, 1280

Forensic engineering

Guidelines for Failure Investigation, 1321

Formwork, construction

Formwork Pressures in Tall and Thick Concrete Walls, 88

Fouling

Membrane Filtration of Coagulated Suspensions, 142

Foundation construction

Foundation Engineering: Current Principles and Practices, 1318

Process of Innovation for Up/Down Construction at Rows Wharf, 70

Foundation design

Foundation Engineering: Current Principles and Practices, 1318

Geotechnical Input to a Major Bridge Project, 464

Foundation settlement

Load Redistribution in Frame with Settling Footings, 106

Foundations

Abutment Pile Design for Jointless Bridges, 960

The Church on Stilts, 1221

Concrete Lunar Base Investigation, 22

Cyclic Axial Loading Analysis of Piles in Sand, 493

Downdrag Forces in Group of Piles, 491

Foundation Engineering: Current Principles and Practices, 1318

Impedance Functions and Input Motions for Embedded Square Foundations, 473

Influence Coefficients for Dynamic Response of Foundations, 417

Model Tests of Gravity Platforms: Description, 533

Necessary Redundancy in Geotechnical Engineering, 532

Probabilistic Consolidation Analysis with Model Updating, 457

Quick Response on the Mississippi, 1256

Reliability of Offshore Foundations: State of the

Art, 455

Seismic Interaction of Structures and Soils: Stochastic Approach, 841

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Sinusoidal Forced Vibration of Sliding Masonry System, 891

Stability Analysis of Embankments on Soft Ground, 458

Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331

Torsional Response of Symmetric Structures, 277

Vertical Vibration of Machine Foundations, 449

Fourier transform

Signal Separation Method for Tower Mode Shape Measurement, 827

Fracture mechanics

Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426

Fracture Mechanics Analysis of High-Strength Concrete, 782

Simulation of Cracking in Large Arch Dam: Part I, 882

Simulation of Cracking in Large Arch Dam: Part II, 883

Size Effects on Strength, Toughness and Ductility, 347

Fracture strength

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336

Size Effects on Strength, Toughness and Ductility, 347

Fractures

Ashland Tank Collapse Investigation, 51

Brace Fractures and Analysis of Phase I Structure, 904

Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371

Measurement and Description of Tensile Fracture in Granite, 382

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Structural Analysis of Bimodular Materials, 322

Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650

Fracturing

Test Embankment Dam of Fracture Grouting, 541

Framed structures

Earthquake Response of Torsionally Coupled, Frame Buildings, 835

In-Plane Vibrations of X-Braced Frames, 410

Interactive Design Optimization of Framed Structures, 105

Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836

Least-Weight Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874

Modeling Laterally Loaded Light-Frame Buildings, 797

Simplified Second-Order Elastic-Plastic Analysis of

Frames, 104

Frames

- Analytical Modeling of Phase 2 Steel Structure, 903
- Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785
- Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821
- Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951
- Effective Length Factor for Columns in Unbraced Frames, 794
- Important Parameters Used in Geodetic Transformations, 1013
- Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
- Nonlinear Effects on Shakedown of Sidesway Frames, 798
- Plastic Reliability Analysis by Directional Simulation, 345
- Potential Errors in Approximate Methods of Structural Analysis, 845
- Quasi-Static Tests of Scaled Model Building, 900
- R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
- Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25
- Yield Surfaces for I-Sections with Biomoments, 968
- Frazil ice**
- Minimization of Frazil-Ice Production by River-Flow Regulation, 623
- Free flow**
- Measurements of Mixed Transient Flows, 559
- Free surfaces**
- Finite Analytic Solution of Flow Over Spillways, 425
- Free-Surface Flow Produced by Accelerating Vertical Cylinder, 359
- Limitations of de Saint Venant Equations in Dam-Break Analysis, 605
- Turbulent Surface Jet in Channel of Limited Depth, 646
- Freeze-thaw cycle**
- Freeze-Thaw Deterioration of Concrete Pavements, 776
- Freeze-thaw durability**
- Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768
- Freeze-Thaw Deterioration of Concrete Pavements, 776
- High-Strength Concrete: Weighing the Benefits, 1282
- Freezing**
- Development and Design of Sludge Freezing Beds, 189
- Effect of Early Freezing on Permeability of Cement Paste, 778
- Freight transportation**

Goods Transportation in Urban Areas, 1319

Frequencies

- Recursive Optimization for Seismic Steel Frames, 812
- Frequency**
- Dynamics of Saturated Rocks. II: Body Waves, 324
- Dynamics of Saturated Rocks. III: Rayleigh Waves, 325
- Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151
- Frequency analysis**
- Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110
- Low-Flow Frequency Analysis Using Probability-Plot Correlation Coefficients, 1092
- River Quality Modeling: Frequency Domain Approach, 731
- Variability of Empirical Flow Quantiles, 554
- Fresh water**
- Models of Sorptive Toxic Substances in Freshwater Systems. I. Basic Equations, 13
- Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14
- Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15
- Friction**
- Cementation Effects in Frictional Materials, 523
- Comparative Study of Base Isolation Systems, 385
- Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426
- Experimental Investigation of Shallow Recirculating Flows, 602
- Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536
- Friction Factors for Small Diameter Plastic Pipes, 560
- Frictional Punch and Crack in Plane Elasticity, 333
- Interaction of Tide and River Flow, 1130
- Mobile-Bed Friction at High Shear Stress, 598
- Nonlinear Failure Envelope for Soils, 479
- Sinusoidal Forced Vibration of Sliding Masonry System, 891
- Soil Resistances to Embedded Anchor Chain in Soft Clay, 526
- Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387
- Friction factor**
- Bed-Surface Size Changes in Gravel-Bed Channel, 592
- Form Resistance in Gravel Channels with Mobile Beds, 570
- Friction Factors for Small Diameter Plastic Pipes, 560
- Stability of Frictional Materials, 376
- Frost heave**
- The History of Frost Research in Minnesota, 134
- Froude number**
- Hydraulic Jump Type Stilling Basin for Low Froude Numbers, 609
- Frozen soils**
- Cold Regions Engineering, 1308

SUBJECT INDEX

Geology

Full-scale tests

Analytical Modeling of Phase 2 Steel Structure, 903

Functional analysis

Infiltration Function from Furrow Stream Advance, 712

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Funding allocations

Implementation Strategies for Salinity Projects, 1114

What's Wrong With Superfund, 1204

Furrow irrigation

Infiltration Function from Furrow Stream Advance, 712

Gables

Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Garages

Predesign Planning for Parking Facilities, 759

Gas

Remote Oil and Gas Facility Construction, 73

Gas flow

Mathematical Modeling of Landfill Gas Extraction, 206

Gas formation

Mathematical Modeling of Landfill Gas Extraction, 206

Gates

Building A Better Wetland, 1245

LP Operation Model for On-Demand Canal Systems, 709

Unconventional Power Sources for Ice Control at Locks and Dams, 133

Gaussian distribution

Contribution of Gaussian Curvature to Strain Energy of Plates, 350

Gaussian process

Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920

Geodesy

Combined Photogeodesy and GPS Network, 990

Development of a GPS Active Control Point Station, 981

Differential GPS: Efficient Tool in Photogrammetry, 1001

Fundamentals of GPS Baseline and Height Determinations, 996

GPS Geodesy and Kinematic Topography Measurements and Results, 991

GPS Satellite Surveys and Vertical Control, 1000

Important Parameters Used in Geodetic Transformations, 1013

Integrated Processing of GPS and Gravity Data, 979

Monitoring Crustal Deformation in Eastern Maine Using GPS, 988

Pipeline Deformation Monitoring Using GPS Survey Techniques, 982

Geodetic surveys

Continuous Deformation Monitoring with GPS, 985

Development of a GPS Active Control Point Station, 981

Establishment of the Kansas City GPS Control Network, 997

Fundamentals of GPS Baseline and Height Determinations, 996

GPS Antenna Design Characteristics for High-Precision Applications, 978

GPS Determination of Ground Water Withdrawal Subsidence, 993

GPS Geodesy and Kinematic Topography Measurements and Results, 991

GPS Processing Methods: Comparison with Precise Trilateration, 992

GPS Satellite Surveys and Vertical Control, 1000

Important Parameters Used in Geodetic Transformations, 1013

Kinematic GPS Land Survey—Description of Operational Test and Results, 987

Kinematic Survey of Clinton Lake Dam, 983

Monitoring Crustal Deformation in Eastern Maine Using GPS, 988

Pipeline Deformation Monitoring Using GPS Survey Techniques, 982

Practical Applications of Global Positioning System, 995

Simultaneous Orbit and Network Adjustment in Tennessee, 980

Surveying With Motorola Eagle GPS Receiver, 999

Geographic information systems

Computing in Civil Engineering: Computers in Engineering Practice, 1312

Decision Support for Estuarine Water Quality Management, 1120

Developments of Geographic Information Systems Technology, 1003

GIS: Technology for Transportation, 1233

Important Parameters Used in Geodetic Transformations, 1013

Multipoint Monitoring, 1253

Geoid

Integrated Processing of GPS and Gravity Data, 979

Geologic mapping

Evaluation of Subsurface Exploration Programs, 80

Geological anomalies

Average Property in Random Two-State Medium, 269

Geological faults

Centrifuge Study of Faulting Effects on Tunnel, 499

Geologic Characterization of Seismic Sources, Moving into the 1990s, 3

Geological surveys

Evaluation of Subsurface Exploration Programs, 80

Geology

The Challenge of Yucca Mountain, 1205

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608

Geometric nonlinearity

Boundary Element Methods in Structural Analysis, 1302

Curved Beam Elements for Nonlinear Analysis, 314

Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343

Post-Buckling Analysis of Steel Space Trusses, 839

Geometry

Geometry of Arrested Thermal Wedges, 1174

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575

Theoretical and Experimental Study of Regular Packings of Granules, 306

Geosynthetics

Geosynthetic Reinforced Soil Structures, 528

Geosynthetic Shields For Dams, 1181

High-Rise Embankments, 1267

Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497

Geotechnical engineering

Journal-Paper Review Procedure and Statistics, 461

Knowledge-Based System for Soil Improvement, 118

Necessary Redundancy in Geotechnical Engineering, 532

Geotextiles

Effect of Envelopes on Flow Pattern Near Drain Pipe, 704

High-Rise Embankments, 1267

Use of Geotextiles and Geocomposites in the United Kingdom, 75

Geothermal energy

Geothermal Energy Applications in Wastewater Treatment, 129

Germany

Simulating Activity Chains: German Approach, 1037

Girders

Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950

Expressway Centerpiece, 1194

Haunches and Hangers, 1199

Heat-Straightening Prototype Damaged Bridge Girders, 884

Pre-Tensioned and Posttensioned Composite Girders, 974

Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901

Glacial lakes

Tapping A Glacier, 1235

Glass

Lateral Buckling in Curtain Wall Systems, 934

Glass fibers

Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Global positioning

Combined Photogeodesy and GPS Network, 990

Continuous Deformation Monitoring with GPS, 985

Development of a GPS Active Control Point Station, 981

Differential GPS: Efficient Tool in Photogrammetry, 1001

Effect of Orbital A Priori Information on Baseline Determinations, 989

Engineering Applications of GPS Differential Surveying, 1006

Establishment of the Kansas City GPS Control Network, 997

Fundamentals of GPS Baseline and Height Determinations, 996

GPS Antenna Design Characteristics for High-Precision Applications, 978

GPS Antenna Set-Up Procedures and Error Sources, 1002

GPS Determination of Ground Water Withdrawal Subsidence, 993

GPS Geodesy and Kinematic Topography Measurements and Results, 991

GPS Processing Methods: Comparison with Precise Trilateration, 992

GPS Satellite Surveys and Vertical Control, 1000

GPS-Guided Vision Systems for Real-Time Surveying, 998

Integrated Processing of GPS and Gravity Data, 979

Kinematic GPS Land Survey—Description of Operational Test and Results, 987

Kinematic Survey of Clinton Lake Dam, 983

Monitoring Crustal Deformation in Eastern Maine Using GPS, 988

Pipeline Deformation Monitoring Using GPS Survey Techniques, 982

Practical Applications of Global Positioning System, 995

Recent Advances in Kinematic GPS Photogrammetry, 984

Selection of GPS Receiver for Survey Applications, 986

Simultaneous Orbit and Network Adjustment in Tennessee, 980

Strategic Planning Tool for GPS Surveys, 994

Surveying With Motorola Eagle GPS Receiver, 999

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Goals

Managing to be Profitable in Design Business: A Case Study, 739

Government agencies

Peer Review in the Public Sector, 223

Problems of Housing in Kuwait, 1067

Public Agency Peer Review: Case Study, 222

Technology and the Constitution, 238

Government employees

Status of Government Civil Engineers in America, 252

Government policies

Land Use and Urban Planning in Paradise: Waikiki, 1060

Technology and the Constitution, 238

Graduate study

Solving Low Enrollment Problems in Civil Engineering, 242

Grain size

Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768

Modeling Mixed Sediment Suspended Load Profiles, 594

Grain storage

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Restoring an Impaired Concrete Silo, 46

Granular materials

Boundary Conditions for Planar Granular Flows, 341

Effect of Solids Property on Rates of Solids Dislodgment, 141

Simple Mean Free Path Theory for Stresses in a Rapid Granular Flow, 340

Theoretical and Experimental Study of Regular Packings of Granules, 306

Granular media

Breakthrough Curves in Granular Media Filtration, 188

Graph theory

Application of Graph Theory to Computer-Assisted Mapping, 1010

Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618

Graphs

Generalization of SCS Curve Number Method, 668

Gravel

Bed-Surface Size Changes in Gravel-Bed Channel, 592

Critical Filters for Impervious Soils, 498

Strength Characteristics of Frozen Fox Gravel, 132

Gravitational flow

Finite Analytic Solution of Flow Over Spillways, 425

Gravity

Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436

Integrated Processing of GPS and Gravity Data, 979

Screaming Structures, 1277

Gravity loads

Cracking the Fire Code, 1218

Gravity sewers

Optimum Design of Large Sewer Networks, 213

Great Lakes

Lake Michigan Diversion and Illinois Waterways, 1140

Green-Ampt model

Time of Concentration Formula for Pervious Catchments, 713

Greens function

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

Bounds on Response Variability of Stochastic Systems, 420

Economical Analysis of Combined Dynamical Systems, 395

Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Structural Response Variability III, 370

Grid systems

Estimating Pit Excavation Volume Using Unequal Intervals, 1011

Three-Point Method for Estimating Cut and Fill Volumes of Land Grading, 695

Grillages

Shakedown of Grids Under Combined Bending and Torsion, 961

Ground motion

Hydrodynamic Pressure on Gravity Dams Subjected to Ground Motions, 299

Internally Braced Cuts in Overconsolidated Soils, 474

Modified Frequency-Domain Data Processing, 408

Simulation of Seismic Ground Motion Using Stochastic Waves, 430

Tieback Supported Cuts in Overconsolidated Soils, 475

Groundware pollution

Urban Groundwater Rise Control: Case Study, 702

Groundwater

Artificial Recharge of Ground Water, 1298

Bias in Groundwater Samples Caused by Wellbore Flow, 566

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Diagnostic Model of Dispersion in Porous Media, 562

Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Evaluation of Deep Pumping Tests, 484

GPS Determination of Ground Water Withdrawal Subsidence, 993

Groundwater Table Simulation Under Different Rice Irrigation Practices, 697

Hydrogeology Comes to the Surface, 1210

Hydrologic Approach to Prediction of Sediment Yield, 581

Irrigated Agriculture and Water Quality in South, 718

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

Modeling Sodium and Chloride in Surface Streams During Base Flows, 177

Multipoint Monitoring, 1253

New Drain Flow Formula, 675

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Research Needs in Irrigation and Drainage—1989, 711

Groundwater

Urban Groundwater Rise Control: Case Study, 702
Water Resources Management in North China Plain, 1109

What a Layperson Needs to Know About Water Rights, 691

Groundwater depletion

GPS Determination of Ground Water Withdrawal Subsidence, 993

Groundwater flow

Applying Groundwater Flow Models in Vapor Extraction System Design, 149

Simple Groundwater Laboratory Models, 597

Steady Drainage of Landfill Covers and Bottom Liners, 209

Groundwater management

Developing a Data Base for Use in Groundwater Management, 1077

Hydraulic Engineering, 1322

Irrigation in Nepal: Opportunities and Constraints, 734

Multipoint Monitoring, 1253

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Water Beneath the City Streets, 1251

Water Resources Management in North China Plain, 1109

Water Resources Planning and Management, 1342

Groundwater pollution

Agriculture and Groundwater Quality, 1242

Bias in Groundwater Samples Caused by Wellbore Flow, 566

Bioremediation: Testing the Waters, 1247

Hydrogeology Comes to the Surface, 1210

Improvements in Soil Absorption Trench Design, 193

Irrigated Agriculture and Water Quality in South, 718

Multipoint Monitoring, 1253

National Water Conference, 1324

Screening of Groundwater Contaminants by Travel-Time Distributions, 170

Groundwater quality

Agriculture and Groundwater Quality, 1242

Bias in Groundwater Samples Caused by Wellbore Flow, 566

Groundwater recharge

Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579

Irrigated Agriculture and Water Quality in the East, 719

Simulating Effect of Channel Changes on Stream Infiltration, 649

Urban Groundwater Rise Control: Case Study, 702

Grouting

Grouting Trends, 1274

Stabilizing a 'Mann'-Sized Sinkhole, 1290

Test Embankment Dam of Fracture Grouting, 541

Growth projections

Impact Fee Program for Fulton County, Georgia, 1061

1989 ASCE TRANSACTIONS

Guidelines

Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

Guide for Evaluating Engineering Software, 1320

Guidelines for Failure Investigation, 1321

Verifying Software by Use, 1223

Gusts

Deterministic Model for Wind-Induced Oscillations of Buildings, 272

Half space

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

Dynamics of Saturated Rocks. III: Rayleigh Waves, 325

Influence Coefficients for Dynamic Response of Foundations, 417

Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472

Hangars

The Jet Set, 1283

Harbors

Ports '89, 1325

Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147

Hardness

Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808

Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336

Hawaii

Land Use and Urban Planning in Paradise: Waikiki, 1060

Hazardous materials

The Asbestos Agenda, 1266

Considerations for Capping Subaqueous Dredged Material Deposits, 1169

Critical Issues in Safe Transport of Hazardous Materials, 1055

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Hazardous waste

Characterization of MSW Incinerator Ash, 167

Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154

Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172

Environmental Engineering, 1316

Expert System for Evaluating and Notifying Hazardous Waste Generators, 108

Putting Waste to Use, 1250

Hazardous waste sites

Assessing Site Assessments, 1273

Fast Tracking Military Waste, 1203

Field Verification of HELP Model for Landfills, 20

A Hazardous Data Explosion, 1296

Training the Waste Watchers, 1254

Hazardous wastes

On-Site Incineration, 1212

Screening of Groundwater Contaminants by Travel-Time Distributions, 170

SUBJECT INDEX

Historic sites

Hazards

- 1990: Decade of Natural Disaster Reduction, 1294
- Risk Analysis and Management of Natural and Man-Made Hazards, 1330

Head loss

- Free-Surface Flow Through a Screen, 630
- Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715

Health hazards

- Agriculture and Groundwater Quality, 1242
- The Model Cleanup, 1219
- Radon Reduction in Crawl Space House, 175
- Risk Analysis and Management of Natural and Man-Made Hazards, 1330

Heat loss

- Thermally Induced Density Currents in Nonrectangular Sidearms, 628

Heat transfer

- Cracking the Fire Code, 1218
- Factors Influencing Thermal Resistivity of Sands, 543

Heat treatment

- Heat-Straightening of Steel: Fact and Fable, 952

Heated water

- Storage of Heated Water in Underground Openings, 480

Heating

- Heat-Straightening of Steel: Fact and Fable, 952

Height

- High-Rise Embankments, 1267

Heuristics

- Current Float Techniques for Resources Scheduling, 84
- Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

High strength concrete

- Fracture Mechanics Analysis of High-Strength Concrete, 782

High strength concretes

- Dynamic Triaxial Tests of High-Strength Concrete, 317

- High-Strength Concrete: Weighing the Benefits, 1282

- Segmental Tunnel Lining Meets 'Buy American', 1269

High strength steel

- On Static Modulus of Elasticity of Normal-Weight Concrete, 940

- Web-Crippling Strength of Cold-Formed Steel Beams, 936

High technology

- High Tech on Campus, 1195
- Is Advanced Technology "The Gateway to Irresponsibility?", 259
- Lunar Structures Generated and Shielded with On-site Materials, 31
- Prototype Robotics in Construction Industry, 77

Highway construction

- Cold Regions Engineering, 1308

- Engineering 21st Century Highways, 1315

- Meeting the Quality Management Issue on Highway Construction, 234

- Organizational Evolution I-595 Port Everglades Expressway, 81

Highway costs

- Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

Highway design

- Computer-Aided Design for Horizontal Alignment, 1042

- Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

- Deck Park Covers Phoenix Freeway, 1184

- Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Highway engineering

- Beautiful Bridges, 1255
- Deck Park Covers Phoenix Freeway, 1184
- Engineering 21st Century Highways, 1315

Highway maintenance

- Cold Regions Engineering, 1308
- Goods Transportation in Urban Areas, 1319

Highway planning

- Engineering 21st Century Highways, 1315
- Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Highway safety

- Critical Issues in Safe Transport of Hazardous Materials, 1055
- Engineering 21st Century Highways, 1315
- Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Highway transportation

- Goods Transportation in Urban Areas, 1319

Highway usage

- Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034
- Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Highways

- Critical Issues in Safe Transport of Hazardous Materials, 1055

- Organizational Evolution I-595 Port Everglades Expressway, 81

- Post-Tensioned Transportation, 1272

Hinges

- Bridge Retrofit Testing: Hinge Cable Restraints, 840

- Collision Tolerant Pile Structure Hinge Concepts, 1132

- Seismic Response of Connections in Two-Bay R/C Frame Joints, 955

Hiring practices

- Fee Vs. Quality, 230

- Finding Qualified People in a Tight Labor Market, 748

Historic sites

- Building Onto History, 1293

New Piers for an Old Bridge, 1190

History

Does Civil Engineering Need System Engineering?, 227

History and Method of Indian Allotment Surveys, 1008

The History of Frost Research in Minnesota, 134

Hydraulic Engineering: Global Challenge, 599

Hollow sections

Inelastic Behavior of Concrete Masonry Shear Walls, 918

Welded-Tee End Connections for Circular Hollow Tubes, 975

Houses

Radon Reduction in Crawl Space House, 175

Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Housing

Affordable Housing: a Challenge to Civil Engineers, 1297

Building Moon Bases, 1176

Problems of Housing in Kuwait, 1067

Review of Standard Practice for Wind-Resistant Manufactured Housing, 27

Housing costs

Affordable Housing: a Challenge to Civil Engineers, 1297

Problems of Housing in Kuwait, 1067

Human behavior

Limitations in Decision Making and System Performance, 45

Simulating Activity Chains: German Approach, 1037

Human factors

Human Error in Structural Design Tasks, 895

Limitations in Decision Making and System Performance, 45

Optimization of Structural Design Checking, 932

Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072

Humid areas

Irrigated Agriculture and Water Quality in South, 718

Humidity

Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174

Hydration

Solidification Theory for Concrete Creep—I. Formulation, 368

Solidification Theory for Concrete Creep II. Verification and Application, 369

Hydraulic conductivity

Chance-Constrained Model for Management of Stream-Aquifer System, 1088

Field Verification of HELP Model for Landfills, 20

Harmonic Mean Conductivity in Declining Rate Filters, 169

Hydraulic Conductivity of Three Landfill Clay Liners, 510

In Situ Hydraulic Conductivity Tests for Com-

pacted Clay, 512

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Reliability Model for Soil Liners: Initial Design, 483

Urban Groundwater Rise Control: Case Study, 702

Verification of Kirkham's Problem of Layered Soil Drainage, 696

Water Movement in Horizontally Layered Soils, 690

Hydraulic design

Artificial Recharge of Ground Water, 1298

Hydraulic Engineering, 1322

Hydraulic engineering

Hydraulic Engineering, 1322

Hydraulic Engineering: Global Challenge, 599

Hydraulic jets

Water Jets Fight Silt, 1180

Hydraulic jump

Hydraulic Jump as "Mixing Layer", 647

Hydraulic Jump in U-Shaped Channel, 590

Hydraulic Jump Type Stilling Basin for Low Froude Numbers, 609

Hydraulic models

Effects of Air Entrainment on Plunge Pool Scour, 573

Hydraulic Engineering, 1322

Optimum Design of Large Sewer Networks, 213

Simple Groundwater Laboratory Models, 597

Submergence Factors for Hydraulic Turbines, 442

Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147

Hydraulic roughness

Form Resistance in Gravel Channels with Mobile Beds, 570

Hydraulic structures

Hydraulic Engineering, 1322

Scour-Depth Prediction Under Armoring Conditions, 633

Hydraulic transportation

Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639

Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640

Hydraulics

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Experiments in Side-Channel Spillways, 587

Friction Factors for Small Diameter Plastic Pipes, 560

Hydraulic Engineering: Global Challenge, 599

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

Hydraulics of Catenary Irrigation Trail Tubes, 669

Interfacial Mixing in Stratified Channel Flows, 601

Inverted V-Notch: Practical Proportional Weir, 733

Mechanics of Overflow Erosion on Embankments: Part I—Research Activities, 612

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations,

613
 Model Study of Safety Grating for Culvert Inlet, 1024
 Routing Procedure for Ungaged Channels, 1079
 Sand Transport in Texas Tidal Inlet, 1152
 Search for the Cause of High-Speed-Channel
 Revetment Failures, 50
 Selection of Stormwater Model Parameters, 153
 Several Sources of Nonuniformity in Irrigation
 Delivery Flows, 725
 Sloping Crest Crump Weir, 676
 Spillway Discharge Calculations in NWS
 DAMBRK, 607
 Supercritical Flow in Channel Junctions, 586
Hydrocarbons
 Dependence of Lunar Bases on Phobos and
 Deimos, 39
Hydrodynamic pressure
 Free-Surface Flow Produced by Accelerating Ver-
 tical Cylinder, 359
 Hydrodynamic Damping on Flexible Cylinders in
 Sheared Flow, 1134
 Hydrodynamic Pressure on Gravity Dams Sub-
 jected to Ground Motions, 299
Hydrodynamics
 Analytic Solutions for Tidal Model Testing, 655
 Capped Water Intakes in a Stratified Crossflow, 563
 Determining Hydrodynamic Force on Accelerating
 Plate in Fluid with Free Surface, 416
 Earthquake Response Spectrum Analysis of In-
 take-Outlet Towers, 349
 Free-Surface Flow Produced by Accelerating Ver-
 tical Cylinder, 359
 Hydrodynamic Analysis of Floods in Urban Sys-
 tem, 1105
 Hydrodynamic and Foundation Interaction Effects
 in Dynamics of Intake Towers: Frequency
 Response Functions, 868
 Hydrodynamic and Foundation Interaction Effects
 in Dynamics of Intake Towers: Earthquake
 Responses, 869
 Hydrodynamic Forces on Large Cylinders in
 Oscillatory Flow, 1156
 Hydrodynamic Forces on Seabed Pipelines, 1136
 Influence of Tension, Weight and Hydrostatic
 Pressure on TLP Tendons, 1135
 Internal Lee Waves in Turbulent Two-Layer Flow,
 629
 Laser Measurements and Computations of Viscous
 Flows Through Cylinders, 621
 Nonlinear Wave Forces on Vertical Cylinders of
 Arbitrary Cross Section, 1173
 Simplified Earthquake Analysis of Concrete Grav-
 ity Dams: Combined Hydrodynamic and Founda-
 tion Interaction Effects, 12
 Simplified Earthquake Analysis of Concrete Gravity
 Dams: Separate Hydrodynamic and Foundation
 Interaction Effects, 11
 Simplified Evaluation of Added Hydrodynamic
 Mass for Intake Towers, 348
 Stability Analysis of Two-Dimensional Depth-
 Averaged Model, 620
 Wave-Tubular Member—Wave and Current In-
 teraction, 1170

Hydroelectric power
 Cavitation Erosion in Hydroturbines, 626
 Civil Engineering Guidelines for Planning and
 Designing Hydroelectric Developments, 1303
 Making Amends with Nature, 1217
 Waterpower '89, 1344
Hydroelectric power generation
 Energy from the Amazon, 1291
 Hydropower Optimization via Sequential Quadratic
 Programming, 1117
 Making Amends with Nature, 1217
 Optimum Diversion Plan for Hydropower Scheme,
 1084
 Waterpower '89, 1344
Hydroelectric powerplants
 Cavitation Erosion in Hydroturbines, 626
 Civil Engineering Guidelines for Planning and
 Designing Hydroelectric Developments, 1303
 Comparing Options for Improving Dissolved Oxy-
 gen Below Hydropower Dam, 439
 Energy from the Amazon, 1291
 Hydro on Hold, 1248
 Hydropower Optimization via Sequential Quadratic
 Programming, 1117
 Multicriterion Analysis of Hydropower Operation,
 445
 Optimal Sequencing of Development for Hydro-
 power Stations in Cascade, 1095
 Quick Response on the Mississippi, 1256
 Relief Valve and Safety Membrane Arrangement in
 Lieu of Surge Tank, 440
 Submergence Factors for Hydraulic Turbines, 442
 Tests of Jet Pump Operating under Head of 300 M,
 441
 Waterpower '89, 1344
Hydroelectric resources
 Comparing Options for Improving Dissolved Oxy-
 gen Below Hydropower Dam, 439
 Waterpower '89, 1344
Hydrogen
 Biological Denitrification of Water, 196
Hydrogen peroxide
 Bioremediation: Testing the Waters, 1247
Hydrogen sulfide
 Sulfide in Wastewater Collection and Treatment
 Systems, 1338
Hydrogeology
 Hydrogeology Comes to the Surface, 1210
Hydrographs
 Response of Muskingum Equation to Step Input,
 714
 Routing Procedure for Ungaged Channels, 1079
 Unification of Muskingum Difference Schemes, 582
Hydrologic data
 Correlated Versus Uncorrelated Hydrologic Sam-
 ples, 1116
Hydrologic models
 Remote Sensing and Fully Distributed Modeling
 for Flood Forecasting, 1122

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Hydrology

The Challenge of Yucca Mountain, 1205

Economic Impact of Micro Catchment Development, 700

Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579

Generalization of SCS Curve Number Method, 668

Hydrodynamic Analysis of Floods in Urban System, 1105

Hydrologic Approach to Prediction of Sediment Yield, 581

Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580

Roughness Values for Overland Flow in Subcatchments, 674

Screening of Groundwater Contaminants by Travel-Time Distributions, 170

Selection of Stormwater Model Parameters, 153

Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Stormwater Detention Basin Nutrient Removal Efficiency, 1075

Use of Stochastic Hydrology in Reservoir Operation, 683

Water Resources of the GCC: International Aspects, 1103

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Water Supply Yield Analysis for the Washington Metropolitan Area, 1086

Hydrostatic pressure

Effect of External Pressure on Strength of Short Tubular Members, 9

Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135

Hydrostatics

Spatial Action of Straight Gravity Dams in Narrow Valleys, 826

Hyperbolic cooling tower

Repair and Completion of Damaged Cooling Tower, 819

Hyperbolic parabolic shells

Effect of Support Movement on Hyperbolic Paraboloid Shells, 786

Hypolimnion

Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166

Hysteresis

Assessment of Seismic Structural Damage, 916

Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908

Behaviors of Steel and Composite Beams at Various Displacement Rates, 910

Cyclic Response of Concrete Bracing Members, 788

Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969

Hysteretic Column Under Earthquake Excitations, 264

Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964

Hysteresis models

Five-Spring Element for Biaxially Bent R/C Columns, 809

Hysteretic Shear Model for Reinforced Concrete Members, 793

Seismic Performance of Steel Frames with Inverted V Braces, 907

Hysteretic system

Inelastic Torsional Response of a Single Story Framed Structure, 373

Hysteretic systems

Scheme to Improve Numerical Analysis of Hysteretic Dynamic Systems, 799

Ice control

Unconventional Power Sources for Ice Control at Locks and Dams, 133

Ice cover

Influence of Vessel Movements on Stability of Restricted Channels, 1153

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Ice forces

Composite Icewall Design and Analysis, 126

Ice gouges

Note on Nearshore Ice Gouge Depths in Alaskan Beaufort Sea, 137

Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136

Ice jams

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Icebergs

Efficiency of Detachable Platforms in the Arctic, 128

Identification

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Modal Identification of Vibrating Structures Using ARMA Model, 402

Illinois

Lake Michigan Diversion and Illinois Waterways, 1140

Impact

Efficiency of Detachable Platforms in the Arctic, 128

Entropy Model for Consistent Impact-Fee Assessment, 1063

Estimating Precipitation Impacts for Scheduling, 96

Evaluation of Navigation Dam Effects on Riverbanks, 1149

Heat-Straightening Prototype Damaged Bridge Girders, 884

Ohio River Bank Erosion—Traffic Effects, 1150

Impact loads

HIBIC: Expert System for Highway Bridge Dy-

namics, 124
 Impact Load Distribution in Concrete Bridge Ties, 816
Impact tests
 FEM Dynamic Fracture Analysis of Concrete Beams, 396
Impedance
 Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699
 Impedance Functions and Input Motions for Embedded Square Foundations, 473
Imperfections
 Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
 Effect of Initial Imperfections on Dynamic Buckling of Shells, 328
 Elastic Stability of Cylindrical Shells with Weld Depressions, 860
 Equations of Curved Beams, 329
 Influential Mode of Imperfection on Carrying Capacity of Structures, 397
 Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
 Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419
 Large Deflections of Orthotropic Plates Under Pressure, 423
 Optimization of Imperfection-Sensitive Structures, 366
 Reliability of Randomly Imperfect Beam-Columns, 403
Impervious membranes
 Blistering of Membranes Over Foam-Concrete Roofs, 771
Implementation
 Implementation Strategies for Salinity Projects, 1114
Impulsive loads
 Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925
In situ tests
 Biological Denitrification of Water, 196
 Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459
 In Situ Hydraulic Conductivity Tests for Compacted Clay, 512
 Interpretation Procedure for Pressuremeter Tests in Sand, 538
 Ray-Path Curvature in Shallow Seismic Investigations, 516
Incentives
 Schedule-Based Construction Incentives, 87
Incineration
 The Battle Over Burning, 1238
 Characterization of MSW Incinerator Ash, 167
 On-Site Incineration, 1212
Incinerators
 On-Site Incineration, 1212
 Properties of Solid Waste Incinerator Fly Ash, 508
 Waste Facility Impacts on Residential Property Values, 1064

Inclusions

A Crack Initiating from Rhombic Rigid Inclusion, 431

Indian reservations

History and Method of Indian Allotment Surveys, 1008

Industrial plants

New Roof for an Aging Temporary, 1276
 Pipe Manipulator Enhancements for Increased Automation, 85

Industrial wastes

Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162

Industries

The Asbestos Agenda, 1266

Inelastic action

Chaotic Behavior of Particle on Vibrating Plate, 352
 Composite Action in Eccentrically Braced Frames, 909
 Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783
 Inelastic Behavior of Concrete Masonry Shear Walls, 918
 Seismic Behavior of Eccentrically Braced Steel Building, 898

Inertia

Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
 Wave-Tubular Member—Wave and Current Interaction, 1170

Infiltration

Analytical Model for Border Irrigation, 729
 Analytical Model of Level Basin Irrigation, 664
 Artificial Recharge of Ground Water, 1298
 Design and Construction of Leaching Systems in Fill Based on Permeability, 155
 Improvements in Soil Absorption Trench Design, 193
 Infiltration Function from Furrow Stream Advance, 712
 Simulating Effect of Channel Changes on Stream Infiltration, 649
 Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083
 Time of Concentration Formula for Pervious Catchments, 713

Infiltration rate

Improvements in Soil Absorption Trench Design, 193
 Infiltration Function from Furrow Stream Advance, 712

Infinite elements

Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539

Inflow

CCGP Model for Multiobjective Reservoir Systems, 1113
 Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575
 Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576

Response of Muskingum Equation to Step Input, 714

Information management

Infrastructure Maintenance Management System Development, 258

Semi-Rigid Steel Beam-to-Column Connections: Data Base and Modeling, 791

Information retrieval

Knowledge Processing for Construction Management Data Base, 71

Information systems

Information Systems and the Economics of Engineering Services, 737

Knowledge Processing for Construction Management Data Base, 71

Loss Prevention Resources, 232

Infrared detectors

Detecting the Defects, 1263

From Guesswork to Guarantee?, 1264

Infrared scanning

Detecting the Defects, 1263

Infrastructure

Alaska's Infrastructure and Limits to Growth, 127

Cincinnati's Dream Team, 1236

Cold Regions Engineering Research—Strategic Plan, 139

Detecting the Defects, 1263

Environmental Engineering Infrastructure: Problems and Needs, 225

Hydraulic Engineering: Global Challenge, 599

Impact Fee Program for Fulton County, Georgia, 1061

Infrastructure Maintenance Management System Development, 258

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

New Frontiers in Civil Engineering: Infrastructure, 254

Preventive Maintenance: Fixing What Ain't Broke, 1261

Injection

Injection of Fine Sands with Very Fine Cement Grout, 545

Inlets, waterways

Sand Transport in Texas Tidal Inlet, 1152

Water Quality Model for Small Tidal Inlet Systems, 152

Innovation

Affordable Housing: a Challenge to Civil Engineers, 1297

Bullwinkle, 1234

Creative Application of Materials Engineering, 1313

Grouting Trends, 1274

Managing for Increased Design and Construction Innovation, 766

Organizing to Increase Innovation in the Construction Firm, 99

Process of Innovation for Up/Down Construction at Rows Wharf, 70

Structural Materials, 1336

Technology and Strategic Management in Construction, 740

Toward Understanding of Product Innovation Process in Construction, 93

Inorganic chemicals

Permeability of Clays Under Organic Permeants, 452

Input

Response of Muskingum Equation to Step Input, 714

Inspection

Construction Materials Quality Management, 47

Meeting the Quality Management Issue on Highway Construction, 234

Optimization of Structural Design Checking, 932

Practical Quality-Controlled Construction, 54

Safer Dams, 1259

Inspection effectiveness

Optimization of Structural Design Checking, 932

Institutions

Future Irrigation Prospects and Actions in Developing World, 706

Instream flow

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

National Water Conference, 1324

Instrumentation

Load Transfer Behavior of Rock-Socketed Piles, 488

Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Insulation

Moisture Accumulation in Insulated Walls in Cold Regions, 130

Insurance

Unified Risk Insurance: An Update, 57

Which Comes First—Responsibility or Liability?, 260

Intake structures

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Frequency Response Functions, 868

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Earthquake Responses, 869

Intakes

Capped Water Intakes in a Stratified Crossflow, 563

Integral equations

Stochastic Finite Element Expansion for Random Media, 326

Interaction

Lateral Pile Interaction Factors in Submerged Sand, 466

Interaction diagrams

Tapered Box Columns Under Biaxial Loading, 888

Interaction models

Design Interaction Equation for Steel Beam-Columns, 859

Linking Civil Engineering Design and Drafting

SUBJECT INDEX

Irrigation efficiency

- Software via IGES, 116
Pipe-Soil Interaction Model, 1137
Storm Drain Design: Diffusive Flood Routing for PCs, 617
- Interactions**
Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278
Interaction of Tide and River Flow, 1130
- Interactive graphics**
Computer Graphics in Truss-Model Design Approach, 120
Decision Support for Estuarine Water Quality Management, 1120
Interactive Graphing of Simulation Networks, 112
Microcomputer-Aided Analysis and Design of Steel Frames, 109
- Interactive systems**
Interactive Design Optimization of Framed Structures, 105
- Interconnected systems**
Performance and Building: Problems of Evaluation, 58
- Interfaces**
Interfacial Mixing in Stratified Channel Flows, 601
Interfacial Stability in Stratified Channel Flows, 619
- Internal pressure**
Mathematical Modeling of Landfill Gas Extraction, 206
Transient Wind-Induced Internal Pressures, 355
- Internal waves**
Bed Waves Generated by Internal Waves in Alluvial Channels, 596
Internal Lee Waves in Turbulent Two-Layer Flow, 629
Surface Thermal Plume in Channel, 600
- International compacts**
1990: Decade of Natural Disaster Reduction, 1294
- International development**
Future Irrigation Prospects and Actions in Developing World, 706
- International treaties**
Panama Canal: Its Past and Its Future, 249
- Intersections**
Accuracy of Turning Flow Estimates at Road Junctions, 1044
Traffic Platoon Dispersion Modeling, 1028
- Inventories**
Automated Lay-Down Yard Control System—ALYC, 94
Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32
- Investment return analysis**
Required Return on Investments in Construction, 66
- Ion exchange**
Economics of Selenium Removal from Drainage Water, 662
- Irrigation**
Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708
Center-Pivot End Gun Irrigation Cost Analysis, 722
Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32
Economic Impact of Micro Catchment Development, 700
Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692
Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672
Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717
Evaluation of Irrigation Planning Decisions, 663
Evapotranspiration in Sudan Gezira Irrigation Scheme, 732
Future Irrigation Prospects and Actions in Developing World, 706
Gravity Irrigation Management in Bangladesh, 705
Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715
Hydraulics of Catenary Irrigation Trail Tubes, 669
Improving Water Delivery System Operation Using Training Simulators, 1110
Irrigated Agriculture and Water Quality in South, 718
Irrigated Agriculture and Water Quality in the East, 719
Irrigation and Drainage Strategies in Salinity-Affected Regions, 679
Irrigation Impact on Groundwater: Model Study in Humid Region, 720
Irrigation in Nepal: Opportunities and Constraints, 734
Irrigation-Induced Contamination: How Real a Problem?, 658
LP Operation Model for On-Demand Canal Systems, 709
Management Model for Control of On-Farm Irrigation, 727
Modeling Yields from Rainfall and Supplemental Irrigation, 677
New Drain Flow Formula, 675
Optimization Models for Wastewater Reuse in Irrigation, 673
Potential of Irrigated Agriculture in Syria, 1093
Research Needs in Irrigation and Drainage—1989, 711
River Quality Modeling: Frequency Domain Approach, 731
River Quality Modeling: Time Domain Approach, 707
Several Sources of Nonuniformity in Irrigation Delivery Flows, 725
Solute Movement Through Root-Soil Environment, 703
- Irrigation districts**
Several Sources of Nonuniformity in Irrigation Delivery Flows, 725
- Irrigation efficiency**
Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708

- Evaluation of Irrigation Planning Decisions, 663
- Evapotranspiration in Sudan Gezira Irrigation Scheme, 732
- Gravity Irrigation Management in Bangladesh, 705
- Irrigation in Nepal: Opportunities and Constraints, 734
- Management Model for Control of On-Farm Irrigation, 727
- Optimal Scheduling of Irrigation Machines: I
—Model Development, 723
- Optimal Scheduling of Irrigation Machines: II
—Applications and Results, 724
- Research Imperatives for Irrigation Science, 689
- Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694
- Systems Analysis of Tank Irrigation: I. Crop Staggering, 687
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
- Irrigation engineering**
- Inverted V-Notch: Practical Proportional Weir, 733
- Irrigation in Nepal: Opportunities and Constraints, 734
- Irrigation machines**
- Optimal Scheduling of Irrigation Machines: I
—Model Development, 723
- Optimal Scheduling of Irrigation Machines: II
—Applications and Results, 724
- Irrigation practices**
- Evaluation of Irrigation Planning Decisions, 663
- Gravity Irrigation Management in Bangladesh, 705
- Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
- Several Sources of Nonuniformity in Irrigation Delivery Flows, 725
- Irrigation programs**
- Potential of Irrigated Agriculture in Syria, 1093
- Irrigation scheduling**
- Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672
- Improved Approach to Irrigation Scheduling Programs, 701
- Irrigation Scheduling Model with Ground Water and Limited Rooting, 726
- LP Operation Model for On-Demand Canal Systems, 709
- Optimal Scheduling of Irrigation Machines: I
—Model Development, 723
- Optimal Scheduling of Irrigation Machines: II
—Applications and Results, 724
- Several Sources of Nonuniformity in Irrigation Delivery Flows, 725
- Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
- Irrigation systems**
- Control of Irrigation Canal Networks, 665
- Gravity Irrigation Management in Bangladesh, 705
- Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715
- Hydraulics of Catenary Irrigation Trail Tubes, 669

- Irrigation in Nepal: Opportunities and Constraints, 734
- Potential of Irrigated Agriculture in Syria, 1093
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
- Isotropic material**
- Stability of Antisymmetric Angle-Ply Laminated Plates, 321
- Structural Analysis of Bimodular Materials, 322
- Isotropy**
- Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413
- Italy**
- Coastal Zone '89, 1304
- Coastlines of Italy, 1306
- Iteration**
- Buckling Loads of Columns with Varying Cross Sections, 303
- Characteristics and Computational Procedure in Softening Plasticity, 364
- Japan**
- Comparison of U.S. and Japanese Practices in Public Construction, 92
- The Race for Smart Cars, 1279
- Jet grouting**
- Foundation Engineering: Current Principles and Practices, 1318
- Jets**
- Tests of Jet Pump Operating under Head of 300 M, 441
- Joint sealants**
- Seepage and Contraction Joints in Concrete Canal Linings, 686
- Jointed rock**
- Anisotropic Nature of Jointed Rock Mass Strength, 295
- Joints**
- Combined Stress Behavior of Structural Glazing Joints, 858
- Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785
- Cyclic Behavior of Double Angle Connections, 852
- Cyclic Tests of Full-Scale Composite Joint Subassemblages, 905
- Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780
- Effective Length Factor for Columns in Unbraced Frames, 794
- Elastic Stability of Lap-Jointed Cylinders, 825
- Finite Element Model for RHS Double Chord K-Joints, 848
- Interior Joints with Variable Anchorage Lengths, 921
- Nonlinear Seismic Analysis of Arch Dams, 310
- Predicting Creep of Nailed Lumber-to-Plywood Joints, 399
- R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
- Response of Masonry Bed Joints in Direct Shear, 922

SUBJECT INDEX

Laboratory tests

Shear Behavior of Regular Triangular Concrete/
Rock Joints—Analysis, 486

Shear Behavior of Regular Triangular Concrete/
Rock Joints—Evaluation, 487

Joints, bonded

Shear and Normal Stresses in Adhesive Joints, 415

Kaolin

Modeling Solute Transport by Centrifugation, 171

Kinematic surveys

Kinematic GPS Land Survey—Description of
Operational Test and Results, 987

Kinematic wave theory

Time of Concentration Formula for Pervious
Catchments, 713

Kinematics

GPS Geodesy and Kinematic Topography Meas-
urements and Results, 991

Kinematic Survey of Clinton Lake Dam, 983

Recent Advances in Kinematic GPS Photogram-
metry, 984

Roughness Values for Overland Flow in Subcatch-
ments, 674

Kinetics

Adsorption Kinetics in GAC Systems for Water
Treatment, 147

Aerobic Sludge Stabilization—Factors Affecting
Kinetics, 157

Biotransformation of Aromatics in Strip-Pit Pond,
185

Dynamic Model of Nitrification in a Fluidized Bed,
195

Effect of Concentration Boundary Layer on Car-
bon Limited Algal Biofilms, 159

Efficient Elimination of Organic Liquid Wastes:
Wet Air Oxidation, 162

Kinetics of Reaction of SO_2 with Marble, 773

Mathematical Interpretation of Aqueous-Phase
Ozone Decomposition Rates, 173

Mathematical Models of Cementation Processes, 16

Performance and Kinetics of Aerated Fluidized Bed
Biofilm Reactor, 145

Rate of Decay of Marble in Laboratory and
Outdoor Exposure, 774

Simplified Equations for Effectiveness Factors in
Anaerobic Biofilms, 210

Knowledge-based systems

Computer Utilization in Structural Engineering,
1310

Computing in Civil Engineering: Computers in
Engineering Practice, 1312

Intelligent Decision Support and Reservoir Man-
agement and Operations, 125

Knowledge Processing for Construction Manage-
ment Data Base, 71

Knowledge-Based Standard-Independent Member
Design, 870

Knowledge-Based System for Soil Improvement,
118

Simulating Construction Robot Agents and Their
Knowledge Environment, 121

Kuwait

Accuracy of Turning Flow Estimates at Road

Junctions, 1044

Problems of Housing in Kuwait, 1067

Labor

Attracting Today's Youth to Civil Engineering, 251

Finding Qualified People in a Tight Labor Market,
748

Impact of Material Management on Productivity
—A Case Study, 82

Labor relations

Comparison of Labor Agreements, 65

Project-Labor Agreements in Construction Indus-
try, 97

Labor unions

Comparison of Labor Agreements, 65

Project-Labor Agreements in Construction Indus-
try, 97

Laboratories

High Tech on Campus, 1195

Model Tests of Gravity Platforms: Description, 533

Reliability of Pseudodynamic Test in Earthquake
Response Simulation, 912

Laboratory equipment

Shear Behavior of Regular Triangular Concrete/
Rock Joints—Evaluation, 487

Laboratory tests

Deformation Characteristics of Reinforced Sand in
Direct Shear, 509

Design Formulas for Unstiffened and Stiffened
Plate Girders in Shear, 950

Effect of Envelopes on Flow Pattern Near Drain
Pipe, 704

Effect of Sediment Density on Bed Load Transport,
556

Factors Influencing Thermal Resistivity of Sands,
543

Fissure Parameters in Stiff Clays Under Compre-
ssion, 518

Injection of Fine Sands with Very Fine Cement
Grout, 545

Interpretation Procedure for Pressuremeter Tests in
Sand, 538

Laboratory Evaluation of Lateral Swelling Pressure,
529

Laboratory Tests of Strip Footing on Reinforced
Cohesive Soil, 520

Limit Analysis of Bolted RHS Flange Plate Joints,
919

Markov Chain Model for Cracking Behavior of
Reinforced Concrete Beams, 914

Mass-Balance Analysis of Anaerobically Decom-
posed Refuse, 207

Measurement of Reaeration in Streams: Compar-
ison of Techniques, 200

Mitigation of Biological Process Upsets Caused by
Organic Inhibitors, 204

Modeling of Unsteady Flow in Curved Channel,
638

Modeling Vertically Mechanically-Laminated Lum-
ber, 946

PCE Volatilized from Stagnant Water and Soil, 215

Random Wave Runup Height on Gentle Slope,
1164

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Resilient Moduli of Soils: Laboratory Conditions, 1329

Riprap Protection Without Filter Layers, 648

Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Sines Revisited, 1145

Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211

Soil-Sheet Pile Interaction in Vibro-Piling, 506

Volume Change Behavior of Vibrated Sand Columns, 462

Wave Forces on Pile in Surface Zone, 1159

Lagoons

Big Trouble in Little America, 1249

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Lagrange's equations

One-Dimensional Lagrangian Consolidation, 496

Scheme for Elasticas with Snap-Back and Looping, 398

Lakes

Approximate Dynamic Lake Phosphorus Budget Models, 190

Estimating Terminal Lake Level Frequencies, 1091

Impact of Land Use and NPS Loads on Lake Quality, 179

Microcomputer Model for Oil Spill Simulation (MICROSS), 103

Modeling Thermal Stratification in Transparent Adirondack Lake, 1099

Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14

Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575

Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576

Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216

A Seawall for Sea Mammals, 1183

Laminar flow

Viscous Damping: Time Convolution of the Impulsive Solution, 652

Laminated wood

Modeling Vertically Mechanically-Laminated Lumber, 946

Steel-Reinforced Glued Laminated Timber, 811

Laminates

Fold and Bond Construction of Cement Laminate Structural Shapes, 779

Laminating

Modeling Vertically Mechanically-Laminated Lumber, 946

Land application

Effect of Wastewater Application Device on Ammonia Volatilization, 218

Land development

Mediating Disputes: Land Development and Construction, 253

Potential of Irrigated Agriculture in Syria, 1093

Land fill

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Land management

Efficient Land Allocation, 1065

Energy from the Amazon, 1291

Land surveys

Combined Photogeodesy and GPS Network, 990

Free Tension Concept for Precise Taping, 1014

General Direct Method for Land Subdivision, 1012

Land treatment

Design of Wastewater Storage Ponds at Land Treatment Sites. 1: Parallels with Applied Reservoir Theory, 182

Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

Land usage

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Efficient Land Allocation, 1065

Groundwater Table Simulation Under Different Rice Irrigation Practices, 697

History and Method of Indian Allotment Surveys, 1008

Impact of Land Use and NPS Loads on Lake Quality, 179

Land Use and Urban Planning in Paradise: Waikiki, 1060

Modeling Sodium and Chloride in Surface Streams During Base Flows, 177

Land usage planning

Efficient Land Allocation, 1065

Energy from the Amazon, 1291

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Land usage regulations

Land Use and Urban Planning in Paradise: Waikiki, 1060

Landfills

Building a Better Landfill Liner, 1209

The CADD Landfill, 1227

Coal Gas Legacy, 1213

Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208

Field Verification of HELP Model for Landfills, 20

Hydraulic Conductivity of Three Landfill Clay Liners, 510

Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207

Mathematical Modeling of Landfill Gas Extraction, 206

Putting Waste to Use, 1250

Steady Drainage of Landfill Covers and Bottom Liners, 209

Landsat

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Remote Sensing and Fully Distributed Modeling for Flood Forecasting, 1122

Landscaping

Beautiful Bridges, 1255

Landslides

Sensitive Strata in Bootlegger Cove Formation, 514

Land-usage planning

Affordable Housing: a Challenge to Civil Engineers, 1297

Laplace transform

Response of Muskingum Equation to Step Input, 714

Lasers

Laser Measurements and Computations of Viscous Flows Through Cylinders, 621

Lateral displacement effect

Lateral Wall Deflections of Braced Excavations in Clay, 494

Lateral forces

Experimental Behavior of Dual Steel System, 796

Seismic Performance of Steel Frames with Inverted V Braces, 907

Lateral loads

Connections Between Precast Elements—Failure Within Connection Region, 976

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Large Deflections of Orthotropic Plates Under Pressure, 423

Modeling Laterally Loaded Light-Frame Buildings, 797

Lateral pressure

Laboratory Evaluation of Lateral Swelling Pressure, 529

Laterites

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Lattices

Continuum Models of Space Station Structures, 40

Estimating Pit Excavation Volume Using Unequal Intervals, 1011

In-Plane Vibrations of X-Braced Frames, 410

Laws

Avoiding and Resolving Disputes in Underground Construction, 1300

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Layered soils

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Verification of Kirkham's Problem of Layered Soil Drainage, 696

Layered systems

Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854

Layout

Basic Problem on Optimal Spatial Cable Layout, 330

Leachates

Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208

Field Verification of HELP Model for Landfills, 20

Hydraulic Conductivity of Three Landfill Clay Liners, 510

Urban Groundwater Rise Control: Case Study, 702

Leaching

Characterization of MSW Incinerator Ash, 167

Irrigated Agriculture and Water Quality in the East, 719

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Lead

Design Method for Bridges on Lead-Rubber Bearings, 966

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Leadership

Improving Management of Technology, 760

Managing to be Profitable in Design Business: A Case Study, 739

Leakage

Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208

Test Embankment Dam of Fracture Grouting, 541

Least squares method

Effect of Orbital A Priori Information on Baseline Determinations, 989

Modal Identification of Vibrating Structures Using ARMA Model, 402

Left-Turns

Effect of Platoons on Permissive Left-Turn Capacity: Pilot Study, 1029

Legal factors

Guidelines for Failure Investigation, 1321

The Long Arm of Liability, 1265

Project-Labor Agreements in Construction Industry, 97

Legislation

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Engineers Legislative Alliance of Wisconsin (ELAW), 256

Loss Prevention Resources, 232

The Saga of Senate Bill 2067, 1207

Technology and the Constitution, 238

Length

Effect of Length on Fatigue Life of Long Thin Continuous Components, 351

Leveling

Monitoring Crustal Deformation in Eastern Maine Using GPS, 988

Liability

Cautious Risk Taking, 1271

Creative Application of Materials Engineering, 1313

A Hazardous Data Explosion, 1296

Impact of Professional Practice Standards on Liability of Engineers, 754

- The Long Arm of Liability, 1265
- Negotiating and Drafting the Civil Engineering Contract, 756
- The Saga of Senate Bill 2067, 1207
- Unified Risk Insurance: An Update, 57
- Which Comes First—Responsibility or Liability?, 260
- Liability insurance**
 - The Long Arm of Liability, 1265
 - Loss Prevention Resources, 232
 - Unified Risk Insurance: An Update, 57
- Life cycles**
 - Computerized Life-Cycle Cost Systems in the Army, 107
- Lift**
 - Wind Induced Vibration of Two Flexible Cylindrical Structures, 392
- Light**
 - Modeling Laterally Loaded Light-Frame Buildings, 797
 - Variability in Photosynthesis: Impact on DO Models, 197
- Light attenuation**
 - Variability in Photosynthesis: Impact on DO Models, 197
- Lime**
 - Evaluation of Admixture Stabilization for Problem Laterite, 1059
 - Power Without Acid, 1237
- Lime soil stabilization**
 - Properties of Solid Waste Incinerator Fly Ash, 508
- Limit analysis**
 - Bearing Capacity of Footings Adjacent to Slopes, 477
 - Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Limit design**
 - Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384
- Limit design method**
 - CSTRUCT: Computer Environment for Design of Steel Structures, 115
 - Residual Stresses in Beams with Yielding During Unloading, 829
- Limit equilibrium**
 - Bearing Capacity of Footings Adjacent to Slopes, 477
 - Geosynthetic Reinforced Soil Structures, 528
- Limit states**
 - Behavior of Concrete Structures in Service, 787
 - Limit State Analysis of Masonry Domes, 837
 - Parametric Sensitivity in First Order Reliability Theory, 361
 - Shakedown of Grids Under Combined Bending and Torsion, 961
- Limiting factors**
 - Is Advanced Technology "The Gateway to Irresponsibility?", 259
 - Sludge Digestion by Anaerobic Fluidized Beds:

II—Kinetic Model, 212

- Linear analysis**
 - Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406
- Linear programming**
 - LP Operation Model for On-Demand Canal Systems, 709
 - Optimization Model for Water Distribution System Design, 632
 - Optimum Design of Large Sewer Networks, 213
 - Shakedown of Grids Under Combined Bending and Torsion, 961
 - Structural System Reliability Using Linear Programming and Simulation, 931
 - Systems Analysis of Tank Irrigation: I. Crop Staggering, 687
- Linear systems**
 - Characteristics of Response to Nonstationary White Noise: Theory, 380
 - Characteristics of Response to Nonstationary White Noise: Applications, 381
- Liners**
 - Building a Better Landfill Liner, 1209
 - Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208
 - Reliability Model for Soil Liners: Initial Design, 483
 - Restoring an Impaired Concrete Silo, 46
- Linings**
 - Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435
- Liquefaction**
 - Influence of Cementation on Liquefaction of Sands, 507
 - Seabed Stability Near Floating Structures, 1168
 - Stress-Path-Dependent Correction for Membrane Penetration, 549
 - Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525
- Liquid**
 - Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162
- Liquids**
 - Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639
 - Mixed-Regime Slurries in Pipelines: II. Experimental Evaluation, 640
- Litigation**
 - Avoiding and Resolving Disputes in Underground Construction, 1300
 - Mediating Disputes: Land Development and Construction, 253
 - Unified Risk Insurance: An Update, 57
 - Which Comes First—Responsibility or Liability?, 260
- Littoral drift**
 - Static Equilibrium Bays: New Relationships, 1142
- Live loads**
 - Calibration of Bridge-Strength Evaluation Code, 879

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Modeling Dynamic Occupant Loads, 875

Load combinations

Design Analysis of Cable Networks, 973

Effect of External Pressure on Strength of Short Tubular Members, 9

Model Tests of Gravity Platforms: Description, 533

Simplified Second-Order Elastic-Plastic Analysis of Frames, 104

Load distribution

Impact Load Distribution in Concrete Bridge Ties, 816

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

Load-Shortening Relationships for Bars, 889

Load factors

Beam-Column Element on Weak Winkler Foundation, 374

Inelastic Buckling of Reinforcing Bars, 262

Nonlinear Effects on Shakedown of Sidesway Frames, 798

Parametric Solution of Stresses in Beams, 287

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Load resistant design factor

Calibration of Bridge-Strength Evaluation Code, 879

Load shifting

The Church on Stilts, 1221

Load tests

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Load Transfer Behavior of Rock-Socketed Piles, 488

Load tests, foundations

Upgrading Footings in Sand with Bored Piles, 546

Load transfer

Glitches in Flitch Beam Design, 1260

Load Redistribution in Frame with Settling Footings, 106

Load Transfer Behavior of Rock-Socketed Piles, 488

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

New Piers for an Old Bridge, 1190

Splitting Induced by Shear Connectors in Composite Beams, 806

Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470

Loading

Beam-Column Element on Weak Winkler Foundation, 374

Creep Buckling of Cylindrical Shell Under Variable Loading, 327

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Role of Damping in Anomalous Response to Short Pulse Loading, 434

Loads

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Analytical Study of Prestressed Composite Beams, 927

Buckling Loads of Columns with Varying Cross Sections, 303

Design Analysis of Cable Networks, 973

Equations of Curved Beams, 329

Exact or Lower Bound Tapered Column Buckling Loads, 851

Experimental Study of Prestressed Composite Beams, 926

Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135

Internally Braced Cuts in Overconsolidated Soils, 474

Limitations of Type II Models for Seismic Hazard, 844

Loads on a Rigid Box Buried in a Nonlinear Medium, 1046

Mapping and Synthesis of Random Pressure Fields, 407

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920

Predicting Deflections of Reinforced Concrete Beams Analytically, 855

Pre-Tensioned and Posttensioned Composite Girders, 974

Response of Marine Pipelines in Scour Trenches, 1155

Spatial Action of Straight Gravity Dams in Narrow Valleys, 826

Structural System Reliability Using Linear Programming and Simulation, 931

System Reliability Under Time Varying Loads: I, 312

System Reliability Under Time Varying Loads: II, 313

Tieback Supported Cuts in Overconsolidated Soils, 475

Upgrading Footings in Sand with Bored Piles, 546

Wind Damage to Masonry Buildings, 37

Local governments

Cincinnati's Dream Team, 1236

Locks

Unconventional Power Sources for Ice Control at Locks and Dams, 133

Long waves

Limitations of de Saint Venant Equations in Dam-Break Analysis, 605

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Low flow

Low-Flow Frequency Analysis Using Probability-Plot Correlation Coefficients, 1092

Low-rise buildings

Seismic Response of Low-Rise Steel Frames, 820

Lysimeters

Hydraulic Conductivity of Three Landfill Clay Liners, 510

Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343

Maine

Deer Isle Bridge: Efficacy of Stiffening Systems, 923

Deer Isle Bridge: Field and Computed Vibrations, 924

Maintenance

Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

Detecting the Defects, 1263

The Great Quake: On Site Reports, 1287

High-Speed Rail Track Design, 1020

Infrastructure Maintenance Management System Development, 258

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

The Jet Set, 1283

Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045

Panama Canal: Its Past and Its Future, 249

Preventive Maintenance: Fixing What Ain't Broke, 1261

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

Rx for Dam Repair, 1278

Maintenance costs

Computerized Life-Cycle Cost Systems in the Army, 107

Management

Action Versus Planning, 747

Automation of Civil Engineers: Some Observations, 758

Business Planning for New Engineering Consulting Firms, 742

Facilities Management With CADD, 1232

Improving Management of Technology, 760

Management Challenges of Integrating Construction Methods and Design Approaches, 744

Managing A Branch Office, 735

Managing Change in the Midst of Economic Uncertainty, 750

Managing for Increased Design and Construction Innovation, 766

Managing to be Profitable in Design Business: A Case Study, 739

Meeting the Quality Management Issue on Highway Construction, 234

Messages: Clear and Effective, 749

Operations Management in Engineering Office, 767

Organizational Culture: Implications for Management, 743

Organizational Evolution I-595 Port Everglades Expressway, 81

Organizing to Increase Innovation in the Con-

struction Firm, 99

Our Most Important Resource: People, 751

Peer Review in the Public Sector, 223

Problems of Housing in Kuwait, 1067

Productivity Measurement: Untangling White-Collar Web, 764

The Program Manager: Mind Over Machine, 1224

Project-Labor Agreements in Construction Industry, 97

Restructuring Organizations: Alternatives and Costs, 746

Super Image-Management: Growing Concern for Productivity Decline, 752

Technology and Strategic Management in Construction, 740

Management methods

Managing A Branch Office, 735

Managing Change in the Midst of Economic Uncertainty, 750

Management planning

Establishing, Operating, and Controlling an Engineering Consulting Firm, 235

Floodplain-Management Plan Enumeration, 1101

Impact Fee Program for Fulton County, Georgia, 1061

Management systems

Ensuring Your Project Managers' 'Buy-In' to Your Project Management System, 736

Infrastructure Maintenance Management System Development, 258

Managing Change in the Midst of Economic Uncertainty, 750

Management training

Training Expatriate Engineering Professionals, 755

Managers

Managing for Increased Design and Construction Innovation, 766

The Program Manager: Mind Over Machine, 1224

Super Image-Management: Growing Concern for Productivity Decline, 752

Manganese

Treatment of Manganese from Mining Seep Using Packed Columns, 163

Manifolds

Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715

Manpower

Attracting Today's Youth to Civil Engineering, 251

Manufacturing facilities

University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341

Mapping

Analytical Solution of Magnetic Declination Problem, 1004

Application of Graph Theory to Computer-Assisted Mapping, 1010

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Developments of Geographic Information Systems Technology, 1003

SUBJECT INDEX

Mathematical models

Frictional Punch and Crack in Plane Elasticity, 333
GPS-Guided Vision Systems for Real-Time Surveying, 998

History and Method of Indian Allotment Surveys, 1008

Mapping and Synthesis of Random Pressure Fields, 407

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Marble

Kinetics of Reaction of SO_2 with Marble, 773

Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774

Marine animals

Classification of Marine Sediments, 447

Marine clays

Classification of Marine Sediments, 447

Marine engineering

Collision Tolerant Pile Structure Hinge Concepts, 1132

Marine plants

Classification of Marine Sediments, 447

Marine terminals

Ports '89, 1325

Marketing

Business Planning for New Engineering Consulting Firms, 742

Gaining Support for Direct Potable Water Reuse, 233

Hubbing and Airline Costs, 1053

Road to Successful Sales—A Three-Step Process, 761

Markov chains

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Markov process

Dynamic Probabilistic Decision Processes, 74

Estimating Precipitation Impacts for Scheduling, 96

Evaluation of Subsurface Exploration Programs, 80

Stochastic Stability of Bridges Considering Coupled Modes: II, 286

Maryland

Irrigated Agriculture and Water Quality in the East, 719

Masonry

Behavior of Brick Masonry Under Cyclic Compressive Loading, 872

Bond Stress/Deformation in Pull-Out Masonry Specimens, 941

Limit State Analysis of Masonry Domes, 837

Response of Masonry Bed Joints in Direct Shear, 922

Shelf Angles for Masonry Veneer, 815

Sinusoidal Forced Vibration of Sliding Masonry System, 891

Wind Damage to Masonry Buildings, 37

Mass

Mass Conservation: 1-D Open-Channel Flow Equations, 565

Mass transfer

Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187

Parameter Evaluation for Carbon Adsorption, 148

Performance and Kinetics of Aerated Fluidized Bed Biofilm Reactor, 145

Mass transport

Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162

Materials

Construction Materials Quality Management, 47

Impact of Material Management on Productivity—A Case Study, 82

Meeting the Quality Management Issue on Highway Construction, 234

Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384

Stochastic Finite Element Expansion for Random Media, 326

Materials engineering

Creative Application of Materials Engineering, 1313

Materials failure

Construction Materials Quality Management, 47

Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384

Materials, properties

Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Stability of Frictional Materials, 376

Materials testing

Construction Materials Quality Management, 47

Materials tests

Application of Orthotropic Failure Criterion to Wood, 316

Mathematical models

Analytical Approach for Evaluation of Settling Column Data, 168

Application of Graph Theory to Computer-Assisted Mapping, 1010

Approximate Dynamic Lake Phosphorus Budget Models, 190

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

Conceptual Construction Process Model, 18

Continuous Distributed Model of Storage Dominated Watershed Runoff, 681

Coupled Vibration of Embedded Foundation, 513

Dilution Discharge Measurement during Flood Wave, 645

Economical Analysis of Combined Dynamical Systems, 395

Error in Variables Parameter Estimation, 156

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Human Error in Structural Design Tasks, 895

Hydrodynamic Analysis of Floods in Urban System, 1105

Inhibitory Substrate Utilization by Steady-State Biofilms, 158

Interfacial Mixing in Stratified Channel Flows, 601

- Internal Lee Waves in Turbulent Two-Layer Flow, 629
- Loading and Unloading Stress-Strain Curves for Brick Masonry, 944
- Mathematical Modeling of Fluvial Sand Delivery, 1144
- Mathematical Modeling of Landfill Gas Extraction, 206
- Mathematical Models of Cementation Processes, 16
- Methodology for Optimal Design of a Parking Lot, 1025
- Model for Calculating Bed Load Transport of Sediment, 555
- Modeling of Unsteady Flow in Curved Channel, 638
- Models of Dam-Break Flow in *R-T* Space, 584
- Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095
- Optimization Models for Wastewater Reuse in Irrigation, 673
- Optimum Design of Large Sewer Networks, 213
- Screening of Groundwater Contaminants by Travel-Time Distributions, 170
- Seismic Analysis of Multistory Building Systems Using Microcomputers, 101
- Soil Resistances to Embedded Anchor Chain in Soft Clay, 526
- Water Distribution System Design Under Uncertainties, 1111
- Water Quality Model for Small Tidal Inlet Systems, 152

Mathematics

- Arch in Soil Arching, 469
- Estimating Pit Excavation Volume Using Unequal Intervals, 1011
- Mathematical Interpretation of Aqueous-Phase Ozone Decomposition Rates, 173
- Prediction of Class A Pan Evaporation in Southwest Idaho, 671
- Random Nature of Soil Porosity and Related Properties, 332

Matrices, mathematics

- Application of Graph Theory to Computer-Assisted Mapping, 1010
- Methods for Analyzing Pipe Networks, 557

Maximum load

- Elastic and Plastic Designs for Maximum Load, 866
- Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956

Maximum probable flood

- Estimating Probabilities of Extreme Rainfalls, 643

Meandering streams

- River-Meander Model: I. Development, 635
- River-Meander Model: II. Applications, 636
- Universal Bank Erosion Coefficient for Meandering Rivers, 933
- Velocity Redistribution in Meandering Rivers, 611

Meanders

- River-Meander Model: I. Development, 635
- River-Meander Model: II. Applications, 636

Measurement

- Fundamentals of GPS Baseline and Height Determinations, 996
- Laser Measurements and Computations of Viscous Flows Through Cylinders, 621
- Measurement of Reaeration in Streams: Comparison of Techniques, 200
- Measurement of Work Progress: Quantitative Technique, 89
- Pressure and Flow Uncertainty in Water Systems, 1085

Measurement instruments

- Prediction of Sediment Sampling Error at Nozzle, 653

Measuring instruments

- Engineering Applications of GPS Differential Surveying, 1006
- Free Tension Concept for Precise Taping, 1014
- Paradox Unresolved, 318
- Productivity Measurement: Untangling White-Collar Web, 764
- Research Needs in Irrigation and Drainage—1989, 711

Mechanics

- Finite Element Analysis of Some Inverse Elasticity Problems, 342
- Setting Stresses in Polymer Composites with Multiple-Size Particles, 784

Mediation

- Mediating Disputes: Land Development and Construction, 253
- Mediation that Worked: Role of OSHA in L'Ambiance Plaza Settlement, 55

Members

- Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

Membrane processes

- Limit State Analysis of Masonry Domes, 837
- Membranes in Water Treatment, 1220

Membrane reinforcement

- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843

Membranes

- Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823
- Blistering of Membranes Over Foam-Concrete Roofs, 771
- Load Transfer Mechanisms in Wind-Loaded Cylinders, 409
- Membrane Filtration of Coagulated Suspensions, 142
- Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187
- Membranes in Water Treatment, 1220
- Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440
- Stress-Path-Dependent Correction for Membrane Penetration, 549

Memoir of deceased members

- Cooper, Alfred Joseph, 1347

SUBJECT INDEX

Model analysis

Dorsch, Roy Albert, 1349

Reh, Carl W., 1345

Vigander, Svien, 1346

Wallhouse, Harold, 1348

Metals

Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384

Methane

Applying Groundwater Flow Models in Vapor Extraction System Design, 149

Biological Denitrification of Water, 196

Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160

Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207

Suburban Superfund, 1206

Methane generation

Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210

Suburban Superfund, 1206

Methodology

Direct Land Grading Design of Irrigation Plane Surfaces, 680

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

Scheme for Elasticas with Snap-Back and Looping, 398

Signal Separation Method for Tower Mode Shape Measurement, 827

Tunnel Talk, 1288

Michigan

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Microbial activity

Bioremediation: Testing the Waters, 1247

Modeling of Enhanced Biodegradation in Unsaturated Soil Zone, 150

Microcomputers

Decision Support for Estuarine Water Quality Management, 1120

Expert System for Evaluating and Notifying Hazardous Waste Generators, 108

LP Operation Model for On-Demand Canal Systems, 709

Microcomputer Model for Oil Spill Simulation (MICROSS), 103

Microcomputer-Aided Analysis and Design of Steel Frames, 109

PC-Based Data Acquisition System for Structural Monitoring, 123

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Productivity Database and Job Cost Control Using Microcomputers, 98

Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117

Surveying With Motorola Eagle GPS Receiver, 999

Middle East

Water Resources of the GCC: International Aspects, 1103

Migration

Modeling Solute Transport by Centrifugation, 171

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Military engineering

Fast Tracking Military Waste, 1203

Mineral deposits

Effect of Envelopes on Flow Pattern Near Drain Pipe, 704

Minimal constraints

Free Net Analysis Under Squared Error Loss, 1009

Minimum weight design

Least-Weight Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874

Minnesota

The History of Frost Research in Minnesota, 134

Minority groups

Method to Deal with DBE Issues, 248

Summer Institutes for Minority High School Students, 236

Missiles

Strategic Defense Initiative Six Years Later in the Army, 30

Mississippi River

Quick Response on the Mississippi, 1256

Mixing

Design of Dilution Junctions for Water-Quality Control, 1124

Interfacial Mixing in Stratified Channel Flows, 601

Interfacial Stability in Stratified Channel Flows, 619

Mixtures

Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639

Mixed-Regime Slurries in Pipelines: II. Experimental Evaluation, 640

Mobility

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Modal analysis

Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171

Dynamic Synthesis of Nonclassically Damped Substructures, 265

Economical Analysis of Combined Dynamical Systems, 395

Mode-Superposition Methods for Elastoplastic Systems, 400

Space Station Structure Modal Selection Criteria, 23

Modal superposition

Mode-Superposition Methods for Elastoplastic Systems, 400

Model accuracy

Error in Variables Parameter Estimation, 156

Model analysis

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Secondary Flow in Mildly Sinuous Channel, 567

Model tests

"Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279

Model verification

Analytic Solutions for Tidal Model Testing, 655

Modeling

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Analytical Modeling of Phase 2 Steel Structure, 903

Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708

Cohesive Sediment Transport Part II: Application, 615

Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539

Current Float Techniques for Resources Scheduling, 84

Modeling for Class-I Sedimentation, 214

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Modeling Solute Transport by Centrifugation, 171

Modeling Vertically Mechanically-Laminated Lumber, 946

Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580

Rainfall Intervention Analysis for On-Line Applications, 1096

Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

River Quality Modeling: Frequency Domain Approach, 731

River Quality Modeling: Time Domain Approach, 707

Time Series Analysis of Water Quality Data in Pearl River, China, 176

Use of Stochastic Hydrology in Reservoir Operation, 683

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Models

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Analytical Model for Border Irrigation, 729

Analytical Model for Longitudinal Soil Vibration, 463

Analytical Model for Shear Slip of Cracked Concrete, 831

Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138

Beam-Column Moment Connections for Composite Frames: Part 2, 958

Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365

Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878

CCGP Model for Multiobjective Reservoir Systems, 1113

Computer Graphics in Truss-Model Design Approach, 120

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Diagnostic Model of Dispersion in Porous Media, 562

Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208

Dynamic and Static Behavior of Cable Dome Model, 807

Dynamic Response Verification of Simplified Bridge-Foundation Model, 460

Earthquake Load for Structural Reliability, 873

Effect of Envelopes on Flow Pattern Near Drain Pipe, 704

Effect of Length on Fatigue Life of Long Thin Continuous Components, 351

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Estimating Estuarine Reaeration Rates, 205

Estimating Precipitation Impacts for Scheduling, 96

FEM Dynamic Fracture Analysis of Concrete Beams, 396

Force Oscillator Model for Rectangular Cylinder, 344

Fracture Mechanics Analysis of High-Strength Concrete, 782

Free-Surface Flow Through a Screen, 630

Geometry of Arrested Thermal Wedges, 1174

Hale Cycle and Indian Drought and Flood Area Indexes, 682

Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108

Hydrodynamic Analysis of Floods in Urban System, 1105

Hydrodynamic Forces on Seabed Pipelines, 1136

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

Loads on a Rigid Box Buried in a Nonlinear Medium, 1046

Management Model for Control of On-Farm Irrigation, 727

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162

Mechanical Model for Oscillating Water Column with Compressibility, 377

Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639

Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640

Model for Response of Concrete To Random Compressive Loads, 953

Model Study of Safety Grating for Culvert Inlet, 1024

Model Tests of Gravity Platforms: Description, 533

Model Tests of Gravity Platforms: Interpretation, 534

Modeling Mixed Sediment Suspended Load Profiles, 594

Modeling Thermal Stratification in Transparent Adirondack Lake, 1099

SUBJECT INDEX

Motion effects

- Modeling Yields from Rainfall and Supplemental Irrigation, 677
- Optimal Scheduling of Irrigation Machines: I
—Model Development, 723
- Optimization of Structural Design Checking, 932
- Parameter Evaluation for Carbon Adsorption, 148
- Performance and Building: Problems of Evaluation, 58
- Performance of a Wedge-Type Absorbing Wave Maker, 1125
- Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192
- Post-Audit Study of Dieldrin Bioconcentration Model, 181
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Predicting Creep of Nailed Lumber-to-Plywood Joints, 399
- Predicting Deflections of Reinforced Concrete Beams Analytically, 855
- Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174
- Probabilistic Potentiometric Surface Mapping, 535
- Productivity Measurement: Untangling White-Collar Web, 764
- Pumping Prediction Model for Highway Concrete Pavements, 1026
- Punching in R.C. Slabs, 890
- Quasi-Static Tests of Scaled Model Building, 900
- Role of Damping in Anomalous Response to Short Pulse Loading, 434
- Scheduling Method for Demand-Responsive Transportation System, 1056
- Simulating Effect of Channel Changes on Stream Infiltration, 649
- Sinusoidal Forced Vibration of Sliding Masonry System, 891
- Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212
- Stability Analysis of Two-Dimensional Depth-Averaged Model, 620
- Surface Thermal Plume in Channel, 600
- Synthetic Models for Through Trips in Small Urban Areas, 1051
- Torsional Response of Symmetric Structures, 277
- Traffic Platoon Dispersion Modeling, 1028
- Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642
- Variability in Photosynthesis: Impact on DO Models, 197
- Velocity Redistribution in Meandering Rivers, 611
- Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803
- Modular structures**
- Remote Oil and Gas Facility Construction, 73
- Structural Analysis of Bimodular Materials, 322
- Modulus of elasticity**
- Elasticity of Particulate Materials, 490
- Further Studies on Elastic Properties of Douglas Fir, 770
- On Static Modulus of Elasticity of Normal-Weight Concrete, 940
- Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
- Moisture content**
- Moisture Accumulation in Insulated Walls in Cold Regions, 130
- Moment distribution**
- Prestressed-Steel Continuous-Span Girders, 867
- Moments**
- Analysis of Multioutrigger-Braced Structures, 896
- Finite Strip-Elements for Thick Plate Analysis, 335
- Five-Spring Element for Biaxially Bent R/C Columns, 809
- Guidelines for Flexural Design of Prestressed Composite Beams, 962
- Seismic Response of Low-Rise Steel Frames, 820
- Momentum transfer**
- Turbulent Surface Jet in Channel of Limited Depth, 646
- Monitoring**
- Considerations for Capping Subaqueous Dredged Material Deposits, 1169
- Continuous Deformation Monitoring with GPS, 985
- Dynamic and Static Testing in Soil Exhibiting Set-Up, 501
- Multipoint Monitoring, 1253
- PC-Based Data Acquisition System for Structural Monitoring, 123
- Monte Carlo method**
- Bounds on Response Variability of Stochastic Systems, 420
- New Plotting Position Formula for Pearson Type-III Distribution, 591
- Numerical Approach for Generating Beta Random Variables, 113
- Plastic Reliability Analysis by Directional Simulation, 345
- Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112
- Pressure and Flow Uncertainty in Water Systems, 1085
- Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917
- Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694
- Moon**
- Building Moon Bases, 1176
- Concrete Lunar Base Investigation, 22
- Dependence of Lunar Bases on Phobos and Deimos, 39
- Lunar Structures Generated and Shielded with On-site Materials, 31
- Structural Engineer's Concept of Lunar Structures, 21
- Mortars**
- Cementation Effects in Frictional Materials, 523
- Motion**
- Chaotic Behavior of Particle on Vibrating Plate, 352
- Motion effects**
- Flow-Induced Vibrations of Rectangular Cylinders, 627

Motion effects

- Internally Braced Cuts in Overconsolidated Soils, 474
- Numerical Solution for Response of Beams With Moving Mass, 792
- Tieback Supported Cuts in Overconsolidated Soils, 475

Mountains

- The Challenge of Yucca Mountain, 1205

Movable bed models

- Sediment Entrainment in Channel with Rippled Bed, 569

Mud

- Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162
- Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146

Multiple objective analysis

- Efficient Land Allocation, 1065
- Multi-Objective Programming Approach for Routing Hazardous Materials, 1058
- Risk Assessment of Extreme Events: Application, 1090
- Water and Urban Land-Use Planning in Cali, Colombia, 1119

Multiple purpose projects

- CCGP Model for Multiobjective Reservoir Systems, 1113

Multiple regressions

- Predicting Reaeration Rates in Texas Streams, 178

Multistory buildings

- Analysis of Multioutrigger-Braced Structures, 896
- Analytical Evaluation of K-Braced Structure Seismic Test, 902
- Analytical Modeling of Phase 2 Steel Structure, 903
- Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
- Quasi-Static Tests of Scaled Model Building, 900
- Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
- Seismic Analysis of Multistory Building Systems Using Microcomputers, 101
- Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901
- Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917
- Seismic Failure Rates of Multistory Frames, 802
- Structural Response Variability III, 370

Municipal wastes

- Characterization of MSW Incinerator Ash, 167
- Dynamic Model of Nitrification in a Fluidized Bed, 195
- Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207

Nails

- Modeling Vertically Mechanically-Laminated Lumber, 946
- Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

National Oceanic and Atmospheric Administration

- Recent Advances in Kinematic GPS Photogrammetry, 984

1989 ASCE TRANSACTIONS

National Weather Service

- Spillway Discharge Calculations in NWS DAMBRK, 607

Natural frequency

- Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Navier-Stokes equations

- Laser Measurements and Computations of Viscous Flows Through Cylinders, 621

Navigation

- Unconventional Power Sources for Ice Control at Locks and Dams, 133

Navigation dams

- Evaluation of Navigation Dam Effects on Riverbanks, 1149

Navy

- New Wharf Covers Trident Submarines, 1182

Negative friction

- Downdrag Forces in Group of Piles, 491

Negligence

- Negotiating and Drafting the Civil Engineering Contract, 756

Negotiations

- Avoiding and Resolving Disputes in Underground Construction, 1300
- A Better Way, 1292
- Cautious Risk Taking, 1271
- Comparison of Labor Agreements, 65
- Fees Versus Quality, 244
- Negotiating and Drafting the Civil Engineering Contract, 756

Network analysis

- Impact Analysis of Owner-Directed Acceleration, 68
- Implicit Network Calibration, 1087

Network design

- Control of Irrigation Canal Networks, 665

Networks

- Automating Design of Boston's Artery, 1229
- Establishment of the Kansas City GPS Control Network, 997
- Resource Leveling in Construction by Optimization, 78
- Unified Activity Network Model, 114
- University Programs in Computer-Aided Engineering, Design, and Manufacturing, 1341

New York City

- Building in Reservoirs, 1179
- Preventive Maintenance: Fixing What Ain't Broke, 1261

New York, State of

- Irrigated Agriculture and Water Quality in the East, 719

Newton-Raphson method

- Post-Buckling Analysis of Steel Space Trusses, 839

Nile River

- Evapotranspiration in Sudan Gezira Irrigation Scheme, 732

SUBJECT INDEX

Nitrates

- Agriculture and Groundwater Quality, 1242
- Biological Denitrification of Water, 196
- Irrigated Agriculture and Water Quality in South, 718
- Irrigated Agriculture and Water Quality in the East, 719

Nitrification

- Dynamic Model of Nitrification in a Fluidized Bed, 195
- Performance and Kinetics of Aerated Fluidized Bed Biofilm Reactor, 145

Nitrites

- Biological Denitrification of Water, 196

Nitrogen

- Dependence of Lunar Bases on Phobos and Deimos, 39
- Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098

Nitrogen removal

- Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184

Noise measurement

- Noise and Air Pollution of High Speed Rail Systems, 1016

Nondestructive tests

- Experiment Design Approach to Nondestructive Testing of Pavements, 1049
- Nondestructive Load Predictions of Concrete Shell Buckling, 857
- Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Nonlinear

- Nonlinear Seismic Analysis of Arch Dams, 310

Nonlinear analysis

- Alternate Analysis of Pressuremeter Test, 548
 - Analytical Parameter Study for Class of Elastomeric Bearings, 930
 - Asymmetrical Buckling of Prestressed Tapered Arches, 388
 - Curved Beam Elements for Nonlinear Analysis, 314
 - Equivalent Linearization Method in Nonlinear FEM, 292
 - Error in Variables Parameter Estimation, 156
 - Improved Algorithm for Stream Function Wave Theory, 1133
 - Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419
 - Material Behavior and Optimum Design of Structural Systems, 849
 - Nonlinear Effects on Shakedown of Sidesway Frames, 798
 - Nonlinear Steady State Seepage into Drains, 685
 - Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
 - Reliability Analysis for Laterally Loaded Piling, 846
 - Vertical Vibration of Machine Foundations, 449
 - Yield Surfaces for I-Sections with Biomoments, 968
- ### Nonlinear differential equations
- Asymmetrical Buckling of Prestressed Tapered

- Arches, 388

Nonlinear programming

- Design Analysis of Cable Networks, 973
- Hydropower Optimization via Sequential Quadratic Programming, 1117
- Implicit Network Calibration, 1087
- Optimum Diversion Plan for Hydropower Scheme, 1084
- Thin-Walled Steel Box Columns Under Biaxial Loading, 948
- Water Distribution System Design Under Uncertainties, 1111
- Water Resources Management in North China Plain, 1109

Nonlinear response

- Uncertainties in Establishing Design Earthquakes, 5

Nonlinear systems

- Pseudolinear and Equivalent Systems for Large Deflections of Members, 414

Nonpoint pollution

- Design of Urban Runoff Quality Controls, 1314
- Impact of Land Use and NPS Loads on Lake Quality, 179
- Modeling Phosphorus Transport in Grass Buffer Strips, 165
- Modeling Sodium and Chloride in Surface Streams During Base Flows, 177
- National Water Conference, 1324
- Stormwater Detention Basin Nutrient Removal Efficiency, 1075

Nuclear electric power generation

- Global Changes and New Challenges for Civil Engineers, 226

Nuclear powerplants

- Positive Influences of Nuclear Construction, 86

Nuclear safety

- Positive Influences of Nuclear Construction, 86

Nuclear waste disposal

- The Challenge of Yucca Mountain, 1205

Nuclear wastes disposal

- Critical Issues in Safe Transport of Hazardous Materials, 1055
- Reclamation of Exxon Ray Point Tailings Basin, 444

Numerical analysis

- Analysis of Continuous, Haunched Box-Girder Bridges by Finite Strips, 850
- Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
- Analytical Evaluation of K-Braced Structure Seismic Test, 902
- Bearing Capacity of Footings Adjacent to Slopes, 477
- Bias in Groundwater Samples Caused by Wellbore Flow, 566
- Buckling Loads of Columns with Varying Cross Sections, 303
- Finite Analytic Solution of Flow Over Spillways, 425
- Methods for Analyzing Pipe Networks, 557

Numerical analysis

- Modeling of Dynamic Systems: An Innovative Approach, 111
- Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608
- Numerical Solution for Response of Beams With Moving Mass, 792
- Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
- Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472
- Rocking Stiffness of Arbitrarily-Shaped Embedded Foundations, 471
- Scheme to Improve Numerical Analysis of Hysteretic Dynamic Systems, 799
- Solidification Theory for Concrete Creep—I. Formulation, 368
- Solidification Theory for Concrete Creep II. Verification and Application, 369
- Stability Analysis of Two-Dimensional Depth-Averaged Model, 620
- Stem Waves Along Breakwater, 1163
- Step-Drawdown Data Analysis, 634
- Unification of Muskingum Difference Schemes, 582
- Numerical calculations**
- Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110
- Cracking the Fire Code, 1218
- Numerical models**
- Centrifuge Study of Faulting Effects on Tunnel, 499
- Cohesive Sediment Transport Part I: Process Description, 614
- Discrete Numerical Model for Soil Mechanics, 467
- Guide for Estimating Riverbed Degradation, 571
- Influence of Vessel Movements on Stability of Restricted Channels, 1153
- Limitations of de Saint Venant Equations in Dam-Break Analysis, 605
- Minimization of Frazil-Ice Production by River-Flow Regulation, 623
- Wave Overtopping on Coastal Structures, 1139
- Wave Transmission Over Submerged Breakwaters, 1165
- Nutrients**
- Biotransformation of Aromatics in Strip-Pit Pond, 185
- Modeling Fate and Transport of Nutrients in the James Estuary, 199
- Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192
- Ocean engineering**
- Barrier Islands: Process and Management, 1301
- Coastal Zone '89, 1304
- Coastlines of the World, 1307
- Compendium of International Ocean Energy Activities, 1309
- Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134
- Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173
- Wave Forces on Pile in Surface Zone, 1159
- Ocean environment**
- Coastlines of Brazil, 1305

- Coastlines of Italy, 1306
- Ocean environments**
- Ocean Outfalls. I. Submerged Wastefield Formation, 550
- Ocean Outfalls. II: Spatial Evolution of Submerged Wastefield, 551
- Ocean Outfalls. III: Effect of Diffuser Design on Submerged Wastefield, 552
- Ocean thermal energy conversion**
- Compendium of International Ocean Energy Activities, 1309
- Odor control**
- Odors: The Other Effluent, 1244
- Odors**
- Odors: The Other Effluent, 1244
- Offshore**
- Model Tests of Gravity Platforms: Description, 533
- Offshore engineering**
- Bullwinkle, 1234
- Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173
- "Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279
- Wave Forces on Fixed Offshore Structures in Short-Crested Seas, 301
- Offshore pipelines**
- Response of Marine Pipelines in Scour Trenches, 1155
- Offshore platform**
- Efficiency of Detachable Platforms in the Arctic, 128
- Offshore platforms**
- Bullwinkle, 1234
- Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158
- Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920
- Signal Separation Method for Tower Mode Shape Measurement, 827
- Tension Leg Platform: a State of the Art Review, 1339
- Offshore structures**
- Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171
- Composite Ice-wall Design and Analysis, 126
- Cyclic Axial Loading Analysis of Piles in Sand, 493
- Effect of External Pressure on Strength of Short Tubular Members, 9
- Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156
- Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135
- In-Plane Vibrations of X-Braced Frames, 410
- Model Tests of Gravity Platforms: Interpretation, 534
- Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173
- Reliability of Offshore Foundations: State of the Art, 455
- Structural Materials, 1336

Tension Leg Platform: a State of the Art Review, 1339

Wave Forces on Pile in Surface Zone, 1159

Ohio River

Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151

Oil

Remote Oil and Gas Facility Construction, 73

Oil spills

Microcomputer Model for Oil Spill Simulation (MICROSS), 103

Oklahoma

Building Onto History, 1293

CCGP Model for Multiobjective Reservoir Systems, 1113

On-site disposal systems

Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184

Exurban Living Using Improved Water and Wastewater Technology, 1066

Open channel flow

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

Calculation of Bed Variation in Alluvial Channels, 572

Experimental Investigation of Shallow Recirculating Flows, 602

Flow Measurement with Trapezoidal Free Overfall, 667

Free-Surface Flow Through a Screen, 630

Hydraulic Jump as "Mixing Layer", 647

Hydraulic Jump in U-Shaped Channel, 590

Limitations of de Saint Venant Equations in Dam-Break Analysis, 605

Mass Conservation: 1-D Open-Channel Flow Equations, 565

Open Channel Flow Through Transverse Floor Outlets, 678

Pressure Recovery in Dividing Open Channels, 610

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Sloping Crest Crump Weir, 676

Stable Predictive Control of Open-Channel Flow, 710

Transitional Flow in Channel Junctions, 564

Turbulence Characteristics of Sediment-Laden Flow, 595

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Velocity Distribution in Open Channel Flow, 585

Open channels

DYN² Method for Optimal Control of Water Flow in Open Channels, 728

Openings

Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650

Operating costs

Methodology for Improving Pump Operation Efficiency, 1081

Operating and Maintenance Costs of the TGV High-Speed Rail System, 1017

Operation

Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

Development and Design of Sludge Freezing Beds, 189

LP Operation Model for On-Demand Canal Systems, 709

Methodology for Improving Pump Operation Efficiency, 1081

Optimal control methods

Active Optimal Control of Structure Using Optimal Observer, 421

Minimization of Raw Water Pumping Costs Using MILP, 1104

Optimal design

Basic Problem on Optimal Spatial Cable Layout, 330

Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821

Effective Length Spectra for Cross Bracings, 972

Elastic and Plastic Designs for Maximum Load, 866

Methodology for Optimal Design of a Parking Lot, 1025

Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367

Optimization Model for Water Distribution System Design, 632

Optimization of Imperfection-Sensitive Structures, 366

Optimum Design of Large Sewer Networks, 213

Performance and Building: Problems of Evaluation, 58

Prager-Shield Optimality Criteria for Linear Segmentation, 273

Recursive Optimization for Seismic Steel Frames, 812

Optimal use

Hydropower Optimization via Sequential Quadratic Programming, 1117

LP Operation Model for On-Demand Canal Systems, 709

Optimal Operation of Water Distribution Systems, 1118

Optimization

Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63

Design Analysis of Cable Networks, 973

DYN² Method for Optimal Control of Water Flow in Open Channels, 728

Dynamic Probabilistic Decision Processes, 74

Efficient Algorithm for Stochastic Structural Optimization, 881

Hydropower Optimization via Sequential Quadratic Programming, 1117

Impact of Earthquakes on Cantilever Retaining Walls, 939

Implementation Strategies for Salinity Projects, 1114

Influential Mode of Imperfection on Carrying Capacity of Structures, 397

Irrigation and Drainage Strategies in Salinity-Affected Regions, 679

- Least-Weight Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874
- Material Behavior and Optimum Design of Structural Systems, 849
- Methodology for Improving Pump Operation Efficiency, 1081
- Minimization of Raw Water Pumping Costs Using MILP, 1104
- Nonlinear Mixed-Discrete Structural Optimization, 822
- On Least-Cost Design of Aqueduct Systems, 1102
- Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367
- Optimal Pump Operation in Water Distribution, 558
- Optimal Sequencing of Development for Hydropower Stations in Cascade, 1095
- Optimization of Structural Design Checking, 932
- Optimum Diversion Plan for Hydropower Scheme, 1084
- Pressure and Flow Uncertainty in Water Systems, 1085
- Resource Leveling in Construction by Optimization, 78
- Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203
- Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694
- Tests of Jet Pump Operating under Head of 300 M, 441
- Truck Capacity Selection for Earthmoving, 72
- Optimization model**
- Interactive Design Optimization of Framed Structures, 105
- Optimization models**
- Aqueduct and Reservoir Capacities for Distribution Systems, 1106
- Chance-Constrained Model for Management of Stream-Aquifer System, 1088
- Efficient Land Allocation, 1065
- LP Operation Model for On-Demand Canal Systems, 709
- Network Models of Water Rights and System Operations, 1115
- Optimal Scheduling of Irrigation Machines: I—Model Development, 723
- Optimal Scheduling of Irrigation Machines: II—Applications and Results, 724
- Optimization Model for Water Distribution System Design, 632
- Optimization Models for Wastewater Reuse in Irrigation, 673
- Reliability Analysis of Water Distribution Systems, 1328
- Resource Leveling in Construction by Optimization, 78
- Selection of GPS Receiver for Survey Applications, 986
- Water Resources Management in North China Plain, 1109
- Water-Quality Management Through Combined Simulation-Optimization Approach, 201
- Oregon**
- Fast Track, Instant Track, 1268

Organic compounds

- Permeability of Clays Under Organic Permeants, 452

Organic matter

- Direct Filtration of *Chlorella* with Cationic Polymer, 161
- Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162

Organization theory

- Organizing to Increase Innovation in the Construction Firm, 99
- Restructuring Organizations: Alternatives and Costs, 746

Organizations

- Organizational Culture: Implications for Management, 743
- Organizational Evolution I-595 Port Everglades Expressway, 81
- Super Image-Management: Growing Concern for Productivity Decline, 752

Orthotropic

- Further Studies on Elastic Properties of Douglas Fir, 770
- Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Orthotropic plate

- Large Deflections of Orthotropic Plates Under Pressure, 423

Orthotropic steel

- Application of Robotics in Bridge Deck Fabrication, 62

Oscillations

- Flow-Induced Vibrations of Rectangular Cylinders, 627
- Force Oscillator Model for Rectangular Cylinder, 344
- Mechanical Model for Oscillating Water Column with Compressibility, 377

Oscillators

- Characteristics of Response to Nonstationary White Noise: Theory, 380
- Characteristics of Response to Nonstationary White Noise: Applications, 381
- Economical Analysis of Combined Dynamical Systems, 395

Oscillatory flow

- Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156

Outfall sewers

- Note on Ayoub's Data of Horizontal Round Buoyant Jet in Current, 606

Outflows

- Response of Muskingum Equation to Step Input, 714

Overconsolidated clays

- Cyclic Behavior of Clays in Undrained Simple Shear, 482

Overflow

- Mechanics of Overflow Erosion on Embankments: Part I—Research Activities, 612

SUBJECT INDEX

Pavement condition

Mechanics of Overflow Erosion on Embankments
Part II. Hydraulic and Design Considerations, 613

Overland flow

Effect of Wastewater Application Device on Ammonia Volatilization, 218

Hydrologic Approach to Prediction of Sediment Yield, 581

Time of Concentration Formula for Pervious Catchments, 713

Overseas assignments

Training Expatriate Engineering Professionals, 755

Overtopping

Mechanics of Overflow Erosion on Embankments:
Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments
Part II. Hydraulic and Design Considerations, 613

Stability of Reef Breakwaters, 1138

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Wave Overtopping on Coastal Structures, 1139

Oxidation

Efficient Elimination of Organic Liquid Wastes:
Wet Air Oxidation, 162

Performance and Kinetics of Aerated Fluidized Bed Biofilm Reactor, 145

Oxygen

Variability in Photosynthesis: Impact on DO Models, 197

Oxygen content

Bioremediation: Testing the Waters, 1247

Measurement of Reaeration in Streams: Comparison of Techniques, 200

Variability in Photosynthesis: Impact on DO Models, 197

Oxygenation

Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439

Ozone

Mathematical Interpretation of Aqueous-Phase Ozone Decomposition Rates, 173

Ozonization

Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160

Panama

Panama Canal: Its Past and Its Future, 249

Panama Canal

Panama Canal: Its Past and Its Future, 249

Panels

Cyclic Tests of Full-Scale Composite Joint Sub-assemblages, 905

High Tech on Campus, 1195

Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419

Parameters

Important Parameters Used in Geodetic Transformations, 1013

List of Sea-State Parameters, 1172

Modal Identification of Vibrating Structures Using

ARMA Model, 402

New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876

Parametric Solution of Stresses in Beams, 287

Parapets

Brick Masonry: U.S. Office Building in Moscow, 43

Parking facilities

Application of VADAS to Complex Traffic Environments, 1050

Parking Garage Crisis, 1262

Predesign Planning for Parking Facilities, 759

Parking lots

Methodology for Optimal Design of a Parking Lot, 1025

Particle distribution

Diffusion in Gas Under Constant Pressure Drop, 383

Improved Filter Criterion for Cohesionless Soils, 450

Particle motion

Chaotic Behavior of Particle on Vibrating Plate, 352

Variable Injection Active-Pulse Air Classification, 164

Particle removal

Modeling for Class-I Sedimentation, 214

Particle Filtration for Wastewater Irrigation, 693

Particle size

Membrane Filtration of Coagulated Suspensions, 142

Particle Size and Shape Effects on Adsorption Rate Parameters, 143

Relative Compaction of Fill Having Oversize Particles, 530

Setting Stresses in Polymer Composites with Multiple-Size Particles, 784

Particles

Breakthrough Curves in Granular Media Filtration, 188

Diffusion in Gas Under Constant Pressure Drop, 383

Membrane Filtration of Coagulated Suspensions, 142

Modeling for Class-I Sedimentation, 214

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394

Particle Filtration for Wastewater Irrigation, 693

Relative Compaction of Fill Having Oversize Particles, 530

Particulate media

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Elasticity of Particulate Materials, 490

Passive control

Comparative Study of Base Isolation Systems, 385

Pavement condition

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Bus-Ride Panel Rating of Pavement Serviceability, 1027

Performance of Full-Scale Pavements Under Ac-

celerated Loading, 1040

Pavement damage

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Pavement design

AASHTO Flexible Pavement Design Equation Study, 1052

Engineering 21st Century Highways, 1315

Post-Tensioned Transportation, 1272

Pumping Prediction Model for Highway Concrete Pavements, 1026

Resilient Moduli of Soils: Laboratory Conditions, 1329

Pavement deterioration

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Pumping Prediction Model for Highway Concrete Pavements, 1026

Pavements

Binders for Snow Roads and Runways in Antarctica, 131

Engineering 21st Century Highways, 1315

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Experiment Design Approach to Nondestructive Testing of Pavements, 1049

The History of Frost Research in Minnesota, 134

Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Performance of Full-Scale Pavements Under Accelerated Loading, 1040

Post-Tensioned Transportation, 1272

Pumping Prediction Model for Highway Concrete Pavements, 1026

Peak runoff

Toward a New Rational Method, 622

Peak values

CO Modeling in Alaska, 140

Nonlinear Failure Envelope for Soils, 479

Peat

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Pedestrian traffic flow

Application of VADAS to Complex Traffic Environments, 1050

Peer review

Peer Review in the Public Sector, 223

Project Peer Review for Deer Island Secondary Treatment Planting, 247

Project Peer Review: Results of the Structural Failures II Conference, 56

Public Agency Peer Review: Case Study, 222

Quality Through Project Peer Reviews, 221

Penetration

Stress-Path-Dependent Correction for Membrane Penetration, 549

Pennsylvania

Post-Tensioned Transportation, 1272

Penstocks

Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440

People movers

Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

People Movers Move Downtown, 1192

Performance

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

Managing to be Profitable in Design Business: A Case Study, 739

Organizational Culture: Implications for Management, 743

Tests of Jet Pump Operating under Head of 300 M, 441

Performance characteristics

HSR Vehicle Performance Characteristics, 1018

Performance evaluation

Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045

Operations Management in Engineering Office, 767

Performance and Building: Problems of Evaluation, 58

Structural Design, Analysis and Testing, 1335

Waterpower '89, 1344

Performance standards

HSR Vehicle Performance Characteristics, 1018

Permeability

Building a Better Landfill Liner, 1209

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Dynamics of Saturated Rocks. II: Body Waves, 324

Dynamics of Saturated Rocks. III: Rayleigh Waves, 325

Effect of Early Freezing on Permeability of Cement Paste, 778

Evaluation of Deep Pumping Tests, 484

Injection of Fine Sands with Very Fine Cement Grout, 545

On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716

Permeability of Clays Under Organic Permeants, 452

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Permeability tests

Permeability of Clays Under Organic Permeants, 452

Permeameters

In Situ Hydraulic Conductivity Tests for Compacted Clay, 512

Personnel development

Managing A Branch Office, 735

Personnel management

Ensuring Your Project Managers' 'Buy-In' to Your Project Management System, 736

Finding Qualified People in a Tight Labor Market,

748

Management/Employee Ethics in Engineering Offices, 228

Managing A Branch Office, 735

Microcomputers: Investing in the Future, 1231

Our Most Important Resource: People, 751

Super Image-Management: Growing Concern for Productivity Decline, 752

Pesticides

Agriculture and Groundwater Quality, 1242

Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154

Irrigated Agriculture and Water Quality in South, 718

Irrigated Agriculture and Water Quality in the East, 719

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Post-Audit Study of Dieldrin Bioconcentration Model, 181

Petroleum

Augering Answers, 1289

pH

Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157

Effect of Concentration Boundary Layer on Carbon Limited Algal Biofilms, 159

Phase angles

Diffraction of SV Waves by Circular Canyons of Various Depths, 389

Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161

Phenol

Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160

Phosphorus

Approximate Dynamic Lake Phosphorus Budget Models, 190

Impact of Land Use and NPS Loads on Lake Quality, 179

Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Modeling Phosphorus Transport in Grass Buffer Strips, 165

Phosphorus removal

Modeling Fate and Transport of Nutrients in the James Estuary, 199

Photoelasticity

Parametric Solution of Stresses in Beams, 287

Photogrammetry

Differential GPS: Efficient Tool in Photogrammetry, 1001

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Recent Advances in Kinematic GPS Photogrammetry, 984

Photographic analysis

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Photography

Combined Photogeodesy and GPS Network, 990

Photosynthesis

Variability in Photosynthesis: Impact on DO Models, 197

Physical properties

Characterization of MSW Incinerator Ash, 167

Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Effect of Early Freezing on Permeability of Cement Paste, 778

Fold and Bond Construction of Cement Laminate Structural Shapes, 779

Fracture Mechanics Analysis of High-Strength Concrete, 782

High-Strength Concrete: Weighing the Benefits, 1282

Mitigation of Biological Process Upsets Caused by Organic Inhibitors, 204

Phytoplankton

Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098

Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192

Piers

Design Method for Bridges on Lead-Rubber Bearings, 966

Hydraulic Jump Type Stilling Basin for Low Froude Numbers, 609

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Piezometers

Polynomial Regression to Forecast Earth Dam Piezometer Levels, 698

Pile bearing capacities

Abutment Pile Design for Jointless Bridges, 960

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Pile driving

Validity of Smith Model in Pile Driving Analysis, 517

Pile groups

Downdrag Forces in Group of Piles, 491

Load Transfer Behavior of Rock-Socketed Piles, 488

Pile lateral loads

Lateral Pile Interaction Factors in Submerged Sand, 466

Reliability Analysis for Laterally Loaded Piling, 846

Pile load tests

Load Transfer Behavior of Rock-Socketed Piles, 488

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Pile structures

Collision Tolerant Pile Structure Hinge Concepts, 1132

Piles

Abutment Pile Design for Jointless Bridges, 960

Cyclic Axial Loading Analysis of Piles in Sand, 493

Downdrag Forces in Group of Piles, 491

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501

Experimental p - y Model for Submerged Stiff Clay, 451

Lateral Pile Interaction Factors in Submerged Sand, 466

Load Transfer Behavior of Rock-Socketed Piles, 488

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Reliability of Offshore Foundations: State of the Art, 455

Pipe flow

Friction Factors for Small Diameter Plastic Pipes, 560

Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618

Methods for Analyzing Pipe Networks, 557

Pipe networks

Optimization Model for Water Distribution System Design, 632

Pipeline design

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Pipelines

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Hydrodynamic Forces on Seabed Pipelines, 1136

Optimization Models for Wastewater Reuse in Irrigation, 673

Pipeline Deformation Monitoring Using GPS Survey Techniques, 982

Pipe-Soil Interaction Model, 1137

Pipes

Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022

Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91

Measurements of Mixed Transient Flows, 559

Pipe Manipulator Enhancements for Increased Automation, 85

Water Beneath the City Streets, 1251

Piping, erosion

Critical Filters for Impervious Soils, 498

Improved Filter Criterion for Cohesionless Soils, 450

Investigation of Crushed Rock Filters for Dam Embankment, 468

Plane strain

Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110

Low-Stress Dilation Test, 489

Planning

Action Versus Planning, 747

Avoiding Transportation Future Shock, 1189

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

Establishing, Operating, and Controlling an Engineering Consulting Firm, 235

Factors Affecting Construction Planning Efforts, 64

Fast Tracking Military Waste, 1203

Groundwater Table Simulation Under Different Rice Irrigation Practices, 697

Microcomputers: Investing in the Future, 1231

Network Models of Water Rights and System Operations, 1115

Optimum Diversion Plan for Hydropower Scheme, 1084

Predesign Planning for Parking Facilities, 759

Project Peer Review for Deer Island Secondary Treatment Planning, 247

Road to Successful Sales—A Three-Step Process, 761

Strategic Planning Tool for GPS Surveys, 994

Water Resources Planning and Management, 1342

Plant engineering

Presented in 3-D, 1226

Plastic deformation

Incremental Resistance and Deformations of Elastoplastic Beams, 861

Plastic deformations

Role of Damping in Anomalous Response to Short Pulse Loading, 434

Plastic design

Elastic and Plastic Designs for Maximum Load, 866

Prager-Shield Optimality Criteria for Linear Segmentation, 273

Shakedown Analysis in Plastic Design of Steel Structures, 281

Plastic hinges

Incremental Resistance and Deformations of Elastoplastic Beams, 861

Plastic pipes

Friction Factors for Small Diameter Plastic Pipes, 560

Plastic properties

Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Seismic Performance of Steel Frames with Inverted V Braces, 907

Strain Increment and Stress Directions in Torsion Shear Tests, 524

Plastic theory

Plastic Reliability Analysis by Directional Simulation, 345

Plasticity

Characteristics and Computational Procedure in Softening Plasticity, 364

Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783

Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418

Fracture Energy-Based Plasticity Formulation of

Plain Concrete, 336

Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925

Prager-Shield Optimality Criteria for Linear Segmentation, 273

Rate-Dependent Material Model for Structural Steel, 291

Residual Stresses in Beams with Yielding During Unloading, 829

Role of Damping in Anomalous Response to Short Pulse Loading, 434

Yield Function for Soil with Anisotropic Fabric, 267

Yield Surfaces for I-Sections with Biomoments, 968

Plastics

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Structural Materials, 1336

Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Plate girders

Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950

Plates

Analytical Solution to Free Vibration of Sector Plates, 429

Bending of Circular Plates Supported at Number of Points, 289

Circular Plate Analysis by Finite Differences: Energy Approach, 337

Compression Tests of Welded Channel Section Columns, 832

Contribution of Gaussian Curvature to Strain Energy of Plates, 350

Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416

Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378

Engineering Large Deflection Theory for Thick Plates, 320

Equivalent Systems for Variable Thickness Plates, 405

Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391

Finite Strip-Elements for Thick Plate Analysis, 335

Mode I Fracture in Concrete Using Center-Cracked Plate Specimens, 285

Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282

Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854

Stability of Antisymmetric Angle-Ply Laminated Plates, 321

Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Thin-Walled Steel Box Columns Under Biaxial Loading, 948

Platforms

Interaction of Finite Amplitude Waves with Platforms or Docks, 1126

Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158

Tension Leg Platform: a State of the Art Review,

1339

Plotting

New Plotting Position Formula for Pearson Type-III Distribution, 591

Plumes

Entrainment by Buoyant Jet Between Confined Walls, 578

Surface Thermal Plume in Channel, 600

Plunging flow

Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575

Pneumatic systems

Mapping and Synthesis of Random Pressure Fields, 407

Poisson ratio

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Further Studies on Elastic Properties of Douglas Fir, 770

Policies

Equipment Policy of Top 400 Contractors: A Survey, 79

Journal-Paper Review Procedure and Statistics, 461

Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045

Political factors

Hydro on Hold, 1248

Pollutants

Modeling Solute Transport by Centrifugation, 171

Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112

Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186

Pollution

Barrier Islands: Process and Management, 1301

Coastlines of Brazil, 1305

Coastlines of Italy, 1306

Water Movement in Horizontally Layered Soils, 690

Pollution abatement

The Asbestos Agenda, 1266

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Pollution control

Design of Urban Runoff Quality Controls, 1314

Power Without Acid, 1237

Water-Quality Management Through Combined Simulation-Optimization Approach, 201

Polymers

Direct Filtration of *Chlorella* with Cationic Polymer, 161

Setting Stresses in Polymer Composites with Multiple-Size Particles, 784

Polynomials

Polynomial Regression to Forecast Earth Dam Piezometer Levels, 698

Ponding

Two Roof Failures Due to Water Ponding and Related Code Requirements, 53

Ponds

Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182

Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

Detention Pond Sizing for Multiple Return Periods, 589

Effect of Pond Depth on Bacterial Mortality Rate, 198

Thermally Induced Density Currents in Nonrectangular Sidearms, 628

Pools

Effects of Air Entrainment on Plunge Pool Scour, 573

Evaluation of Navigation Dam Effects on Riverbanks, 1149

Population growth

Future Irrigation Prospects and Actions in Developing World, 706

Global Changes and New Challenges for Civil Engineers, 226

Summer Institutes for Minority High School Students, 236

Pore water

Nonisothermal Consolidation in Unsaturated Soil, 522

Pore water pressure

Evaluation of Deep Pumping Tests, 484

Observed Performance of a Deep Excavation in Clay, 504

Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Porosity

Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268

Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768

Dynamics of Saturated Rocks. I: Equations of Motion, 323

Dynamics of Saturated Rocks. II: Body Waves, 324

Dynamics of Saturated Rocks. III: Rayleigh Waves, 325

Strength and Porosity of Portland Cement Paste Subjected to Chloride Penetration, 769

Porous media

Breakthrough Curves in Granular Media Filtration, 188

Ports

Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63

Ports '89, 1325

Positioning

Automated Lay-Down Yard Control System—ALYC, 94

Post tensioning

Deck Park Covers Phoenix Freeway, 1184

Pre-Tensioned and Posttensioned Composite Girders, 974

Unbonded Performance, 1275

Postbuckling behavior

Buckling and Postbuckling Analyses of Struts with Discrete Supports, 307

Inelastic Buckling of Reinforcing Bars, 262

Post-Buckling Analysis of Steel Space Trusses, 839

Potable water

Gaining Support for Direct Potable Water Reuse, 233

Power

Unconventional Power Sources for Ice Control at Locks and Dams, 133

Power loss

Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387

Power output

A Capacity Expansion Model for Hydrothermal Power Systems, 1082

Power spectrum analysis

Simulation of Seismic Ground Motion Using Stochastic Waves, 430

Powerplants

A Capacity Expansion Model for Hydrothermal Power Systems, 1082

Capped Water Intakes in a Stratified Crossflow, 563

Fired Up at Fort Drum, 1200

Power Without Acid, 1237

Preconsolidation pressure

Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459

Predictions

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

The Challenge of Yucca Mountain, 1205

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

CO Modeling in Alaska, 140

Cohesive Sediment Transport Part I: Process Description, 614

Cohesive Sediment Transport Part II: Application, 615

Deer Isle Bridge: Field and Computed Vibrations, 924

Estimating Precipitation Impacts for Scheduling, 96

Evaluation of Subsurface Exploration Programs, 80

Free-Surface Flow Through a Screen, 630

Hydrodynamic Forces on Seabed Pipelines, 1136

Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914

Model for Response of Concrete To Random Compressive Loads, 953

New Method for Prediction of Extreme Wind Speeds, 315

Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327

Prediction of Class A Pan Evaporation in Southwest Idaho, 671

Rainfall Intervention Analysis for On-Line Applications, 1096

Segmental Box Girder: Deflection Probability and Bayesian Updating, 937

SUBJECT INDEX

Small-Scale Model Tests of Structural Steel Assemblies, 906
Wave Transmission Over Submerged Breakwaters, 1165
Wave-Tubular Member—Wave and Current Interaction, 1170
Predictive control
Characteristics and Computational Procedure in Softening Plasticity, 364
Control Systems of Building Structures by Active Cables, 959
Experimental Digital Control of Structures, 339
Stable Predictive Control of Open-Channel Flow, 710
Prefabrication
Review of Standard Practice for Wind-Resistant Manufactured Housing, 27
Strategies for Mitigating Damage to Metal Building Systems, 26
Pressure distribution
Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416
Pressure Distribution in Radial Flow Between Disks, 274
Pressure measurement
Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435
Pressuremeter tests
Alternate Analysis of Pressuremeter Test, 548
Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459
Interpretation Procedure for Pressuremeter Tests in Sand, 538
Pressuremeters
Alternate Analysis of Pressuremeter Test, 548
Pressures
Diffusion in Gas Under Constant Pressure Drop, 383
Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038
Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162
Mapping and Synthesis of Random Pressure Fields, 407
Pressure Recovery in Dividing Open Channels, 610
Role of Damping in Anomalous Response to Short Pulse Loading, 434
Test Embankment Dam of Fracture Grouting, 541
Pressurized flow
Measurements of Mixed Transient Flows, 559
Prestressing
Analytical Study of Prestressed Composite Beams, 927
Asymmetrical Buckling of Prestressed Tapered Arches, 388
Design Analysis of Cable Networks, 973
Dynamic and Static Behavior of Cable Dome Model, 807
The Effect of Compatibility and Prestressing on Optimized Trusses, 828
Effects of Transverse Prestressing in Bridge Decks,

Probability density functions

19
Experimental Study of Prestressed Composite Beams, 926
Guidelines for Flexural Design of Prestressed Composite Beams, 962
Prestressed Concrete Beams with Opening Under Torsion and Bending, 949
Prestressed-Steel Continuous-Span Girders, 867
Pretensioning
Dynamic and Static Behavior of Cable Dome Model, 807
Pre-Tensioned and Posttensioned Composite Girders, 974
Pricing
Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117
Prisms
Mapping and Synthesis of Random Pressure Fields, 407
Private sector
Private Sector Risk Analysis: Applied to Dam Safety, 765
Role of Private Sector Finance, 224
Privatization
Entropy Model for Consistent Impact-Fee Assessment, 1063
Fired Up at Fort Drum, 1200
Probabilistic method
Probabilistic Potentiometric Surface Mapping, 535
Probabilistic methods
Velocity Distribution in Open Channel Flow, 585
Probabilistic models
Average Property in Random Two-State Medium, 269
Evaluation of Subsurface Exploration Programs, 80
Geologic Prediction Model for Tunneling, 7
Modeling Yields from Rainfall and Supplemental Irrigation, 677
Probabilistic Consolidation Analysis with Model Updating, 457
Risk Analysis for Dam Design in Karst, 492
Probability
Dynamic Probabilistic Decision Processes, 74
Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161
Low-Flow Frequency Analysis Using Probability-Plot Correlation Coefficients, 1092
Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914
Modeling Dynamic Occupant Loads, 875
Modeling Yields from Rainfall and Supplemental Irrigation, 677
New Plotting Position Formula for Pearson Type-III Distribution, 591
Segmental Box Girder: Deflection Probability and Bayesian Updating, 937
Probability density functions
Numerical Approach for Generating Beta Random Variables, 113
Probability distribution

New Method for Prediction of Extreme Wind Speeds, 315

New Plotting Position Formula for Pearson Type-III Distribution, 591

Variability of Empirical Flow Quantiles, 554

Probability distributions

Screening of Groundwater Contaminants by Travel-Time Distributions, 170

Probability theory

Efficient Algorithm for Stochastic Structural Optimization, 881

Limitations of Type II Models for Seismic Hazard, 844

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920

Parametric Sensitivity in First Order Reliability Theory, 361

Plastic Reliability Analysis by Directional Simulation, 345

Random Nature of Soil Porosity and Related Properties, 332

System Reliability Under Time Varying Loads: I, 312

Problem solving

Action Versus Planning, 747

Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250

Error Estimation for Boundary Element Analysis, 386

Method for Solving Inverse Elastoviscoplastic Problems, 401

What is an "Ethical" Engineer?, 763

Procedures

Bullwinkle, 1234

Comparison of U.S. and Japanese Practices in Public Construction, 92

Process variables

Cohesive Sediment Transport Part I: Process Description, 614

Productivity

Impact of Material Management on Productivity—A Case Study, 82

Information Systems and the Economics of Engineering Services, 737

Operations Management in Engineering Office, 767

Production, Cost, and Increased Salinity in Water, 1123

Productivity Database and Job Cost Control Using Microcomputers, 98

Productivity Measurement: Untangling White-Collar Web, 764

Robotic Roundup, 1222

Super Image-Management: Growing Concern for Productivity Decline, 752

Truck Capacity Selection for Earthmoving, 72

Professional activities

Engineers Legislative Alliance of Wisconsin (ELAW), 256

Professional advancement

Ensuring Your Project Managers' 'Buy-In' to Your

Project Management System, 736

Peer Review in the Public Sector, 223

Technology and the Constitution, 238

Professional development

Future of Civil Engineering Profession and Role of Education, 229

Training the Waste Watchers, 1254

Professional engineering

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Fees Versus Quality, 244

Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246

Future of Civil Engineering Profession and Role of Education, 229

Our Most Important Resource: People, 751

Professional personnel

Finding Qualified People in a Tight Labor Market, 748

Professional practice

Business Planning for New Engineering Consulting Firms, 742

Communications Failure in Hyatt Regency Disaster, 245

Cost-Estimating Principles, 95

Does Civil Engineering Need System Engineering?, 227

The Elusive Engineering Style, 257

Fee Vs. Quality, 230

Fees Versus Quality, 244

Impact of Professional Practice Standards on Liability of Engineers, 754

Loss Prevention Resources, 232

Our Most Important Resource: People, 751

Peer Review in the Public Sector, 223

Project Peer Review: Results of the Structural Failures II Conference, 56

What is an "Ethical" Engineer?, 763

Which Comes First—Responsibility or Liability?, 260

Professional registration

Civil Engineering Design Professors Should be Registered Engineers, 240

Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246

Professional role

Communications Failure in Hyatt Regency Disaster, 245

Professional schools

First, Second, and Third Thoughts on Civil Engineering Education, 231

Future of Civil Engineering Profession and Role of Education, 229

Profile measurement

Modeling Mixed Sediment Suspended Load Profiles, 594

Profits

Managing to be Profitable in Design Business: A Case Study, 739

Required Return on Investments in Construction,

66
 Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117
Progressive failure
 Progressive Collapse: U.S. Office Building in Moscow, 44
 System Reliability Under Time Varying Loads: I, 312
 System Reliability Under Time Varying Loads: II, 313
Progressive waves
 Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162
Project control
 Conceptual Construction Process Model, 18
Project evaluation
 Intermittent Project Management, 741
 Management Challenges of Integrating Construction Methods and Design Approaches, 744
 Quality Through Project Peer Reviews, 221
Project feasibility
 Factors Affecting Construction Planning Efforts, 64
Project management
 Excellence in the Constructed Project, 1317
 Impact Analysis of Owner-Directed Acceleration, 68
 Intermittent Project Management, 741
 Managing a Megaproject, 1225
 Measurement of Work Progress: Quantitative Technique, 89
 Practical Quality-Controlled Construction, 54
 Process of Innovation for Up/Down Construction at Rows Wharf, 70
 Project Peer Review: Results of the Structural Failures II Conference, 56
 Schedule-Based Construction Incentives, 87
 Shopping for Better Project Management, 1175
Project managers
 Intermittent Project Management, 741
Project planning
 Impact Analysis of Owner-Directed Acceleration, 68
 Irrigation and Drainage Strategies in Salinity-Affected Regions, 679
 Management Challenges of Integrating Construction Methods and Design Approaches, 744
 Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095
 Project Peer Review for Deer Island Secondary Treatment Planning, 247
 Staging of Water Resource Developments, 438
Projects
 Automated Lay-Down Yard Control System—ALYC, 94
 Compendium of International Ocean Energy Activities, 1309
 Impact Analysis of Owner-Directed Acceleration, 68
 Post-Audits of Environmental Programs and Projects, 1326

Role of Private Sector Finance, 224
 Top Projects for 1989, 1240
Properties
 Multi-Objective Programming Approach for Routing Hazardous Materials, 1058
Property values
 Property-Value Guarantees for Waste Facilities, 1068
 Waste Facility Impacts on Residential Property Values, 1064
Protective structures
 Countering Terrorist Threats, 1230
Pseudodynamic method
 Analytical Evaluation of K-Braced Structure Seismic Test, 902
 Analytical Modeling of Phase 2 Steel Structure, 903
 Pseudodynamic Test Method—Current Status and Future Directions, 913
 Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
 Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901
Public benefits
 Does Ethical Engineering Practice Affect Creativity?, 4
Public buildings
 Problems of Housing in Kuwait, 1067
Public employees
 Public Agency Peer Review: Case Study, 222
Public health
 Cold Regions Environmental Engineering: Tomorrow's Challenges, 135
 Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
Public information programs
 The Pros and Cons of Public Education, 1193
Public information systems
 Attracting Today's Youth to Civil Engineering, 251
Public land
 History and Method of Indian Allotment Surveys, 1008
Public opinion
 Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261
 Gaining Support for Direct Potable Water Reuse, 233
Public participation
 Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261
 Engineers Legislative Alliance of Wisconsin (ELAW), 256
 New Frontiers in Civil Engineering: Infrastructure, 254
 The Pros and Cons of Public Education, 1193
 What is an "Ethical" Engineer?, 763
Public policy
 Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261
 Cincinnati's Dream Team, 1236

Engineers Legislative Alliance of Wisconsin (ELAW), 256

New Frontiers in Civil Engineering: Infrastructure, 254

Public safety

Private Sector Risk Analysis: Applied to Dam Safety, 765

Public transportation

Avoiding Transportation Future Shock, 1189

Public Works

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Comparison of U.S. and Japanese Practices in Public Construction, 92

Contractor Financing, Public Works in Saudi Arabia, 60

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

Project-Labor Agreements in Construction Industry, 97

The Pros and Cons of Public Education, 1193

Publications

Loss Prevention Resources, 232

Pull-out resistance

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Marine Curing of Steel Fiber Composites, 775

Pump intakes

Prediction of Sediment Sampling Error at Nozzle, 653

Pumped storages

Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

Pumping

Chance-Constrained Model for Management of Stream-Aquifer System, 1088

Evaluation of Deep Pumping Tests, 484

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Gravity Irrigation Management in Bangladesh, 705

Mathematical Modeling of Landfill Gas Extraction, 206

Methodology for Improving Pump Operation Efficiency, 1081

Minimization of Raw Water Pumping Costs Using MILP, 1104

Optimal Operation of Water Distribution Systems, 1118

Optimal Pump Operation in Water Distribution, 558

Pumping Prediction Model for Highway Concrete Pavements, 1026

Pumping stations

Optimization Model for Water Distribution System Design, 632

Pumping tests, wells

Step-Drawdown Data Analysis, 634

Pumps

Optimal Pump Operation in Water Distribution, 558

Optimization Model for Water Distribution System Design, 632

Prediction of Sediment Sampling Error at Nozzle, 653

Tests of Jet Pump Operating under Head of 300 M, 441

Quality assurance

Checking Models in Structural Design, 864

Construction Materials Quality Management, 47

Fee Vs. Quality, 230

Measuring Design and Construction Quality Costs, 83

Meeting the Quality Management Issue on Highway Construction, 234

Positive Influences of Nuclear Construction, 86

Practical Quality-Controlled Construction, 54

Project Peer Review: Results of the Structural Failures II Conference, 56

Quality Undergraduate Engineering Education—A Critical Perspective, 241

Quality control

Checking Models in Structural Design, 864

Construction Materials Quality Management, 47

Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63

Measuring Design and Construction Quality Costs, 83

Meeting the Quality Management Issue on Highway Construction, 234

Practical Quality-Controlled Construction, 54

Project Peer Review: Results of the Structural Failures II Conference, 56

Public Agency Peer Review: Case Study, 222

Quality Through Project Peer Reviews, 221

Quantitative analysis

Selection of GPS Receiver for Survey Applications, 986

Questionnaires

Equipment Policy of Top 400 Contractors: A Survey, 79

Radar

From Guesswork to Guarantee?, 1264

General Aviation Collision-Avoidance Alternatives, 1047

GOES Satellite Data in Rainfall Estimation, 721

Radial flow

Models of Dam-Break Flow in $R-T$ Space, 584

Pressure Distribution in Radial Flow Between Disks, 274

Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651

Radiation

Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472

Vertical Vibration of Machine Foundations, 449

Radioactive materials

Cap Stabilization for Reclaimed Uranium Sites, 443

Radon

Radon Reduction in Crawl Space House, 175

Rail transportation

SUBJECT INDEX

Reclaimed water

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

Critical Issues in Safe Transport of Hazardous Materials, 1055

Noise and Air Pollution of High Speed Rail Systems, 1016

Railroad engineering

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

High-Speed Rail Track Design, 1020

Railroad ties

High-Speed Rail Track Design, 1020

Railroad tracks

High-Speed Rail Track Design, 1020

Railroads

Noise and Air Pollution of High Speed Rail Systems, 1016

Operating and Maintenance Costs of the TGV High-Speed Rail System, 1017

Rainfall

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Checking Flood Frequency Curves Using Rainfall Data, 583

Economic Impact of Micro Catchment Development, 700

Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579

GOES Satellite Data in Rainfall Estimation, 721

Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580

Rainfall Intervention Analysis for On-Line Applications, 1096

Simulation Models of Sequences of Dry and Wet Days, 684

Rainfall frequency

Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579

Estimating Precipitation Impacts for Scheduling, 96

Estimating Probabilities of Extreme Rainfalls, 643

GOES Satellite Data in Rainfall Estimation, 721

Simulation Models of Sequences of Dry and Wet Days, 684

Rainfall intensity

Estimating Probabilities of Extreme Rainfalls, 643

Rainfall-runoff relationships

Checking Flood Frequency Curves Using Rainfall Data, 583

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Random error

Experiment Design Approach to Nondestructive Testing of Pavements, 1049

Probabilistic Potentiometric Surface Mapping, 535

Random processes

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394

Response-Surface Approach for Reliability Analysis, 433

System Reliability Under Time Varying Loads: I, 312

System Reliability Under Time Varying Loads: II, 313

Random variables

Model for Response of Concrete To Random Compressive Loads, 953

Reliability of Randomly Imperfect Beam-Columns, 403

Structural Response Variability III, 370

Random vibration

Characteristics of Response to Nonstationary White Noise: Theory, 380

Characteristics of Response to Nonstationary White Noise: Applications, 381

Seismic Risk Analysis of Buried Pipelines, 1031

Random waves

Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161

Groupiness Factor and Wave Height Distribution, 1131

Random Wave Runup Height on Gentle Slope, 1164

Wave Envelope and Related Spectra, 1157

Rapid transit railways

Capital Cost and Operations of High-Speed Rail System in West Germany, 1019

HSR Cost Estimating Techniques in Pennsylvania, 1021

Operating and Maintenance Costs of the TGV High-Speed Rail System, 1017

Rapid transit systems

High-Speed Rail Track Design, 1020

HSR Vehicle Performance Characteristics, 1018

Noise and Air Pollution of High Speed Rail Systems, 1016

Rates

Cohesive Sediment Transport Part I: Process Description, 614

Cohesive Sediment Transport Part II: Application, 615

Mathematical Interpretation of Aqueous-Phase Ozone Decomposition Rates, 173

PCE Volatilized from Stagnant Water and Soil, 215

Ratings

Bus-Ride Panel Rating of Pavement Serviceability, 1027

Rational functions

Toward a New Rational Method, 622

Rayleigh waves

Dynamics of Saturated Rocks. III: Rayleigh Waves, 325

Reaeration

Estimating Estuarine Reaeration Rates, 205

Measurement of Reaeration in Streams: Comparison of Techniques, 200

Predicting Reaeration Rates in Texas Streams, 178

Recirculation

Experimental Investigation of Shallow Recirculating Flows, 602

Reclaimed water

Artificial Recharge of Ground Water, 1298

Reclamation

Cap Stabilization for Reclaimed Uranium Sites, 443
Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540

Reclamation of Exxon Ray Point Tailings Basin, 444

Reconnaissance

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Reconstruction

Building in Reservoirs, 1179

Recreation

Screaming Structures, 1277

Recruiting

Attracting Today's Youth to Civil Engineering, 251
Finding and Keeping Technical Experts in the 1990s, 738

Finding Qualified People in a Tight Labor Market, 748

Solving Low Enrollment Problems in Civil Engineering, 242

Rectangular cross section

Flow-Induced Vibrations of Rectangular Cylinders, 627

Rectangular hollow sections

Finite Element Model for RHS Double Chord K-Joints, 848

Limit Analysis of Bolted RHS Flange Plate Joints, 919

Recursive functions

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Recycling

The Battle Over Burning, 1238

Gaining Support for Direct Potable Water Reuse, 233

Optimization Models for Wastewater Reuse in Irrigation, 673

Redundancy

Material Behavior and Optimum Design of Structural Systems, 849

Necessary Redundancy in Geotechnical Engineering, 532

System Reliability Under Time Varying Loads: II, 313

Reefs

Stability of Reef Breakwaters, 1138

Reflection

Performance of a Wedge-Type Absorbing Wave Maker, 1125

Refraction

Strategic Planning Tool for GPS Surveys, 994

Refuse derived fuel

Variable Injection Active-Pulse Air Classification, 164

Refuse disposal

Variable Injection Active-Pulse Air Classification, 164

Regional analysis

Cluster Analysis as Applied to Regional Flood Frequency, 1107

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Regional development

Establishment of the Kansas City GPS Control Network, 997

Regional planning

Establishment of the Kansas City GPS Control Network, 997

Regionalization in Water Supply Industry: Status and Needs, 1094

Registration

Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246

Regression analysis

GOES Satellite Data in Rainfall Estimation, 721

Polynomial Regression to Forecast Earth Dam Piezometer Levels, 698

Probabilistic Potentiometric Surface Mapping, 535

Regression models

Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Regulation

Regionalization in Water Supply Industry: Status and Needs, 1094

Regulation of Agricultural Drainage to the San Joaquin River, 660

Regulations

Assessing Site Assessments, 1273

Sludge in the Nineties, 1246

Rehabilitation

Award for an A-Frame, 1241

Building in Reservoirs, 1179

Cincinnati's Dream Team, 1236

Dams Reborn, 1214

Grouting Trends, 1274

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Irrigation in Nepal: Opportunities and Constraints, 734

New Frontiers in Civil Engineering: Infrastructure, 254

New Piers for an Old Bridge, 1190

Rebuilding Roebling Delaware Aqueduct Bridge, 865

Roof Collapse, Taxi Cab Company Garage, Campaign, Illinois, 49

Rx for Dam Repair, 1278

Safer Dams, 1259

Upgrading Footings in Sand with Bored Piles, 546

Waterpower '89, 1344

Reinforced, concrete

Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925

Reinforced plastic pipe

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Reinforcement

Bond Stress/Deformation in Pull-Out Masonry

Specimens, 941

Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808

Crack Control in Beams Using Deformed Wire Fabric, 945

Finite Element Model for Curved Embedded Reinforcement, 308

Geosynthetic Reinforced Soil Structures, 528

High-Rise Embankments, 1267

Inelastic Buckling of Reinforcing Bars, 262

Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520

Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Reinforcing steels

Restoring an Impaired Concrete Silo, 46

Relaxation, mechanics

Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Reliability

Average Property in Random Two-State Medium, 269

Calibration of Bridge-Strength Evaluation Code, 879

Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182

Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

Evaluation of New Concepts for Cellular Structure Construction, 61

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Optimization Models for Wastewater Reuse in Irrigation, 673

Optimization of Structural Design Checking, 932

Pressure and Flow Uncertainty in Water Systems, 1085

Reliability Model for Soil Liners: Initial Design, 483

Reliability of Offshore Foundations: State of the Art, 455

Reliability-Based Design of Wood Structural Systems, 886

Stochastic Finite Element Expansion for Random Media, 326

System Reliability Under Time Varying Loads: I, 312

System Reliability Under Time Varying Loads: II, 313

Reliability analysis

Parametric Sensitivity in First Order Reliability Theory, 361

Reliability Analysis for Laterally Loaded Piling, 846

Reliability Analysis of the Mohr Failure Criterion, 290

Reliability Analysis of Water Distribution Systems, 1328

Reliability of Offshore Foundations: State of the Art, 455

Response-Surface Approach for Reliability Anal-

ysis, 433

Relief valves

Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440

Remote sensing

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32

Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172

GOES Satellite Data in Rainfall Estimation, 721

Remote Sensing and Fully Distributed Modeling for Flood Forecasting, 1122

Research Imperatives for Irrigation Science, 689

Renovation

Building Onto History, 1293

Domed Renovations, 1257

New Roof for an Aging Temporary, 1276

New Wharf Covers Trident Submarines, 1182

Rebuilding Philadelphia's El, 1187

Repairing

Cavitation Erosion in Hydroturbines, 626

Cincinnati's Dream Team, 1236

Durability of Posted and Epoxy-Grouted Timber Piles, 834

Heat-Straightening of Steel: Fact and Fable, 952

Heat-Straightening Prototype Damaged Bridge Girders, 884

Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045

Rx for Dam Repair, 1278

Use of Geotextiles and Geocomposites in the United Kingdom, 75

Repeated loading

Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969

Resilient Moduli of Soils: Laboratory Conditions, 1329

Shakedown of Grids Under Combined Bending and Torsion, 961

Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810

Research

Analytical Parameter Study for Class of Elastomeric Bearings, 930

Cold Regions Engineering Research—Strategic Plan, 139

Finite Element Modeling of Left Ventricle, 375

The History of Frost Research in Minnesota, 134

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments Part II. Hydraulic and Design Considerations, 613

Method to Deal with DBE Issues, 248

Research Imperatives for Irrigation Science, 689

Simulating Construction Robot Agents and Their Knowledge Environment, 121

Strategic Defense Initiative Six Years Later in the Army, 30

Structural Design, Analysis and Testing, 1335

University Programs in Computer-Aided Engi-

neering, Design, and Manufacturing, 1341

Research and development

Compendium of International Ocean Energy Activities, 1309

Prototype Robotics in Construction Industry, 77

Toward Understanding of Product Innovation Process in Construction, 93

Use of Geotextiles and Geocomposites in the United Kingdom, 75

Research needs

Cold Regions Engineering Research—Strategic Plan, 139

Engineering 21st Century Highways, 1315

Research Imperatives for Irrigation Science, 689

Research Needs in Irrigation and Drainage—1989, 711

Reservoir design

Building in Reservoirs, 1179

Reservoir operation

CCGP Model for Multiobjective Reservoir Systems, 1113

Economic Impact of Micro Catchment Development, 700

Improving Water Delivery System Operation Using Training Simulators, 1110

Intelligent Decision Support and Reservoir Management and Operations, 125

Use of Stochastic Hydrology in Reservoir Operation, 683

Reservoir performance

Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182

Reservoir storage

Aqueduct and Reservoir Capacities for Distribution Systems, 1106

Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182

Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183

Water Rights Modeling and Analysis, 1097

Reservoir systems

CCGP Model for Multiobjective Reservoir Systems, 1113

Intelligent Decision Support and Reservoir Management and Operations, 125

Reservoirs

Aqueduct and Reservoir Capacities for Distribution Systems, 1106

Building in Reservoirs, 1179

Cohesive Sediment Transport Part II: Application, 615

Economic Impact of Micro Catchment Development, 700

Hydro on Hold, 1248

Intelligent Decision Support and Reservoir Management and Operations, 125

Measurement of Upwelling Flow from Air Diffuser, 220

Models of Sorptive Toxic Substances in Freshwater

Systems. II: Lakes and Reservoirs, 14

Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575

Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576

Optimal Sequencing of Development for Hydropower Stations in Cascade, 1095

Optimization Models for Wastewater Reuse in Irrigation, 673

Optimum Diversion Plan for Hydropower Scheme, 1084

Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192

Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216

Water Resources Planning and Management, 1342

Resident engineers

Excellence in the Constructed Project, 1317

Residual shear strength

Nonlinear Failure Envelope for Soils, 479

Residual soils

Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459

Investigation of Crushed Rock Filters for Dam Embankment, 468

Residual strength

Design Problems in Soil Liquefaction, 17

Residual stress

Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422

Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970

Buckling Strength of Partially Restrained I-Beams, 862

Residual Stresses in Beams with Yielding During Unloading, 829

Tapered Box Columns Under Biaxial Loading, 888

Thin-Walled Steel Box Columns Under Biaxial Loading, 948

Resilience

Resilient Moduli of Soils: Laboratory Conditions, 1329

Resins

Setting Stresses in Polymer Composites with Multiple-Size Particles, 784

Resistance

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Form Resistance in Gravel Channels with Mobile Beds, 570

Structural System Reliability Using Linear Programming and Simulation, 931

Resource allocation

Current Float Techniques for Resources Scheduling, 84

Operations Management in Engineering Office, 767

Resource development

Alaska's Infrastructure and Limits to Growth, 127

Resource management

Current Float Techniques for Resources Sched-

uling, 84
 Resource Leveling in Construction by Optimization, 78
Resource recovery
 The Battle Over Burning, 1238
Resources
 Lunar Structures Generated and Shielded with On-site Materials, 31
Response Spectra
 Assessment of Seismic Structural Damage, 916
 Comparative Study of Base Isolation Systems, 385
 Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278
 Inelastic Torsional Response of a Single Story Framed Structure, 373
 Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
 Wind Response Spectrum, 390
Response time
 Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394
Responses
 Bounds on Response Variability of Stochastic Systems, 420
Responsibilities
 Creative Application of Materials Engineering, 1313
Responsibility
 Communications Failure in Hyatt Regency Disaster, 245
 Is Advanced Technology "The Gateway to Irresponsibility?", 259
 Organizational Evolution I-595 Port Everglades Expressway, 81
 Quality Through Project Peer Reviews, 221
 Which Comes First-Responsibility or Liability?, 260
Retaining walls
 Arch in Soil Arching, 469
 Geostatic Wall Pressures, 519
 Geosynthetic Reinforced Soil Structures, 528
 Impact of Earthquakes on Cantilever Retaining Walls, 939
 Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497
 Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503
Retention
 Attracting Today's Youth to Civil Engineering, 251
 On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716
Retention dam
 Storing Sediment and Freeing Fish, 1258
Retrofitting
 1990: Decade of Natural Disaster Reduction, 1294
 Bridge Retrofit Testing: Hinge Cable Restrainers, 840
 Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194
 The Great Quake: On Site Reports, 1287

Restoring an Impaired Concrete Silo, 46
Reversing flow
 Effect of Early Freezing on Permeability of Cement Paste, 778
Revetments
 Maximum Periodic Wave Run-up on Smooth Slopes, 1167
 Search for the Cause of High-Speed-Channel Revetment Failures, 50
 Wave Overtopping on Coastal Structures, 1139
Reviewing
 Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246
 Journal-Paper Review Procedure and Statistics, 461
 Modification of Behavior of Double-Layer Grids: Overview, 847
Reynolds stress
 Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656
Rheology
 Analytical Study on Deformation of Fresh Concrete, 293
Rice
 Gravity Irrigation Management in Bangladesh, 705
Ridership
 Bus-Ride Panel Rating of Pavement Serviceability, 1027
Rigid pipes
 Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618
Rigid-body dynamics
 Influence Coefficients for Dynamic Response of Foundations, 417
 Loads on a Rigid Box Buried in a Nonlinear Medium, 1046
Rings
 Equations of Curved Beams, 329
 Repair and Completion of Damaged Cooling Tower, 819
Riparian rights
 What a Layperson Needs to Know About Water Rights, 691
Riprap
 Cap Stabilization for Reclaimed Uranium Sites, 443
 Riprap Design, 604
 Riprap Protection Without Filter Layers, 648
Risk
 Dynamic Probabilistic Decision Processes, 74
 Estimating Terminal Lake Level Frequencies, 1091
 Free Net Analysis Under Squared Error Loss, 1009
 A Hazardous Data Explosion, 1296
 Human Error in Structural Design Tasks, 895
 Required Return on Investments in Construction, 66
 Risk Analysis and Management of Natural and Man-Made Hazards, 1330
 Unified Risk Insurance: An Update, 57
Risk acceptance

Unified Risk Insurance: An Update, 57

Risk analysis

Countering Terrorist Threats, 1230

Earthquake Load for Structural Reliability, 873

Private Sector Risk Analysis: Applied to Dam Safety, 765

Required Return on Investments in Construction, 66

Risk Analysis and Management of Natural and Man-Made Hazards, 1330

Risk Analysis for Dam Design in Karst, 492

Risk Assessment of Extreme Events: Application, 1090

Seismic Risk Analysis of Buried Pipelines, 1031

Risk management

Checking Models in Structural Design, 864

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Risk Analysis and Management of Natural and Man-Made Hazards, 1330

Screaming Structures, 1277

Risk taking

Cautious Risk Taking, 1271

Dynamic Probabilistic Decision Processes, 74

Risks

Wind Design Problems with Building Structures During Construction, 29

River beds

Applicability Index for Sand Transport Equations, 644

Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641

Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083

River flow

Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Quick Response on the Mississippi, 1256

River regulation

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

River systems

Hydrodynamic Analysis of Floods in Urban System, 1105

Rivers

Acoustic Measurement of River Discharge, 603

Evaluation of Navigation Dam Effects on Riverbanks, 1149

Geometry of Arrested Thermal Wedges, 1174

Hydrologic Approach to Prediction of Sediment Yield, 581

Interaction of Tide and River Flow, 1130

Microcomputer Model for Oil Spill Simulation (MICROSS), 103

Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15

Ohio River Bank Erosion—Traffic Effects, 1150

Predicting Reaeration Rates in Texas Streams, 178

River Quality Modeling: Frequency Domain Approach, 731

River Quality Modeling: Time Domain Approach, 707

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Storing Sediment and Freeing Fish, 1258

Universal Bank Erosion Coefficient for Meandering Rivers, 593

Variability in Photosynthesis: Impact on DO Models, 197

Roads

Accuracy of Turning Flow Estimates at Road Junctions, 1044

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Robotics

Application of Robotics in Bridge Deck Fabrication, 62

Potential Robotics Utilization in Construction, 67

Prototype Robotics in Construction Industry, 77

Robotic Roundup, 1222

Simulating Construction Robot Agents and Their Knowledge Environment, 121

Rock bolts

Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456

Rock masses

Anisotropic Nature of Jointed Rock Mass Strength, 295

Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456

Rock properties

Storage of Heated Water in Underground Openings, 480

Rock structures

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Rockfill structures

Construction and Performance of Two Large Rockfill Embankments, 544

Rocks

Dynamics of Saturated Rocks. I: Equations of Motion, 323

Dynamics of Saturated Rocks. II: Body Waves, 324

Dynamics of Saturated Rocks. III: Rayleigh Waves, 325

Load Transfer Behavior of Rock-Socketed Piles, 488

Measurement and Description of Tensile Fracture in Granite, 382

Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486

Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487

Roof failures

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

New Roof for an Aging Temporary, 1276

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

SUBJECT INDEX

Safety factors

Two Roof Failures Due to Water Ponding and Related Code Requirements, 53

Roofing materials

The Jet Set, 1283

Roofs

Blistering of Membranes Over Foam-Concrete Roofs, 771

Buckling Analysis of Segmented Conical Concrete Shell Roof, 877

Building Onto History, 1293

Designing Structures for Snow Loads, 804

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

The Jet Set, 1283

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

New Roof for an Aging Temporary, 1276

Rotation

Buckling Loads of Columns with Varying Cross Sections, 303

Geostatic Wall Pressures, 519

Rocking Stiffness of Arbitrarily-Shaped Embedded Foundations, 471

Seismic Response of Low-Rise Steel Frames, 820

Rotational flow

Finite Analytic Solution of Flow Over Spillways, 425

Roughness

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650

Roughness coefficient

Roughness Values for Overland Flow in Subcatchments, 674

Routing

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Roughness Values for Overland Flow in Subcatchments, 674

Routing Procedure for Ungaged Channels, 1079

Rubber

Creative Application of Materials Engineering, 1313

Design Method for Bridges on Lead-Rubber Bearings, 966

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Rubble-mound breakwaters

Breakwater Choices, 1243

Rubble-Mound Breakwaters with S-Shape Design, 1160

Stability of Reef Breakwaters, 1138

Runoff

Continuous Distributed Model of Storage Dominated Watershed Runoff, 681

Economic Impact of Micro Catchment Development, 700

Generalization of SCS Curve Number Method, 668

Hydrologic Approach to Prediction of Sediment Yield, 581

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Modeling Phosphorus Transport in Grass Buffer Strips, 165

Roughness Values for Overland Flow in Subcatchments, 674

Tapping A Glacier, 1235

Use of Stochastic Hydrology in Reservoir Operation, 683

Runoff forecasting

Generalization of SCS Curve Number Method, 668

Rural areas

Big Trouble in Little America, 1249

Exurban Living Using Improved Water and Wastewater Technology, 1066

High Hopes for Cattails, 1215

Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083

Safety

Efficient Algorithm for Stochastic Structural Optimization, 881

Formwork Pressures in Tall and Thick Concrete Walls, 88

Human Error in Structural Design Tasks, 895

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Model Study of Safety Grating for Culvert Inlet, 1024

Reliability-Based Design of Wood Structural Systems, 886

Robotic Roundup, 1222

Safer Dams, 1259

Setting Sights on Safety, 1177

Structural Response Variability III, 370

Which Comes First—Responsibility or Liability?, 260

Safety analysis

Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349

Safer Dams, 1259

Safety education

Setting Sights on Safety, 1177

Safety engineering

Earthquake Load for Structural Reliability, 873

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Model Study of Safety Grating for Culvert Inlet, 1024

Structures for Enhanced Safety and Physical Security, 1337

Safety factors

Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299

Safety factors

Reliability Analysis of the Mohr Failure Criterion, 290

Structural Response Variability III, 370

Use of STABL Program in Tied-back Wall Design, 476

Safety programs

Setting Sights on Safety, 1177

Safety research

Structures for Enhanced Safety and Physical Security, 1337

Salaries

ASCE 1987 Salary Survey, 239

Sales management

Road to Successful Sales—A Three-Step Process, 761

Salinity

Agricultural Drainage Water—How Should it be Regulated in California?, 657

Design of Dilution Junctions for Water-Quality Control, 1124

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Implementation Strategies for Salinity Projects, 1114

Irrigation and Drainage Strategies in Salinity-Affected Regions, 679

Production, Cost, and Increased Salinity in Water, 1123

Solute Movement Through Root-Soil Environment, 703

Salt balance

Solute Movement Through Root-Soil Environment, 703

Salt domes

Electricity From Air, 1239

Salt removal

Implementation Strategies for Salinity Projects, 1114

Salt water

Implementation Strategies for Salinity Projects, 1114

Interfacial Mixing in Stratified Channel Flows, 601

Interfacial Stability in Stratified Channel Flows, 619

Salt water barriers

Implementation Strategies for Salinity Projects, 1114

Salination

Model for Calculating Bed Load Transport of Sediment, 555

Salts

Freeze-Thaw Deterioration of Concrete Pavements, 776

Salts effects

Freeze-Thaw Deterioration of Concrete Pavements, 776

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Samplers

Comparison: US P-61 and Delft Sediment Sam-

plers, 654

Samples

Correlated Versus Uncorrelated Hydrologic Samples, 1116

Sampling

Comparison: US P-61 and Delft Sediment Samplers, 654

Prediction of Sediment Sampling Error at Nozzle, 653

Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151

Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525

Sand

Applicability Index for Sand Transport Equations, 644

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268

Design Problems in Soil Liquefaction, 17

Effect of Envelopes on Flow Pattern Near Drain Pipe, 704

Factors Influencing Thermal Resistivity of Sands, 543

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Influence of Cementation on Liquefaction of Sands, 507

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Lateral Pile Interaction Factors in Submerged Sand, 466

Prediction of Sediment Sampling Error at Nozzle, 653

Simple Groundwater Laboratory Models, 597

Slip Mechanism-Based Constitutive Model for Granular Soils, 311

Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525

Upgrading Footings in Sand with Bored Piles, 546

Volume Change Behavior of Vibrated Sand Columns, 462

Yield Function for Soil with Anisotropic Fabric, 267

Sand transport

Sand Transport in Texas Tidal Inlet, 1152

Sandwich panels

Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343

Sanitary landfills

Waste Facility Impacts on Residential Property Values, 1064

Sanitary sewers

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Satellite mapping

Development of a GPS Active Control Point Station, 981

Practical Applications of Global Positioning System, 995

Simultaneous Orbit and Network Adjustment in Tennessee, 980
Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Satellite photography

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Satellites

Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32
GOES Satellite Data in Rainfall Estimation, 721
GPS Antenna Design Characteristics for High-Precision Applications, 978
GPS Satellite Surveys and Vertical Control, 1000
Important Parameters Used in Geodetic Transformations, 1013
Simultaneous Orbit and Network Adjustment in Tennessee, 980
Strategic Planning Tool for GPS Surveys, 994
Surveying With Motorola Eagle GPS Receiver, 999

Saturation

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406
Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539
Density Tests Above Zero Air Voids Line, 502
Dynamics of Saturated Rocks. I: Equations of Motion, 323
Dynamics of Saturated Rocks. II: Body Waves, 324
Dynamics of Saturated Rocks. III: Rayleigh Waves, 325
Effect of Length on Fatigue Life of Long Thin Continuous Components, 351

Saudi Arabia

Contractor Financing, Public Works in Saudi Arabia, 60

Scale effect

Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503
Small-Scale Model Tests of Structural Steel Assemblies, 906

Scale effects

Wave-Tubular Member—Wave and Current Interaction, 1170

Scale modes

Small-Scale Model Tests of Structural Steel Assemblies, 906

Scheduling

Estimating Precipitation Impacts for Scheduling, 96
Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100
Fast Track, Instant Track, 1268
Hubbing and Airline Costs, 1053
Impact Analysis of Owner-Directed Acceleration, 68
Optimal Operation of Water Distribution Systems, 1118
Resource Leveling in Construction by Optimization, 78
Schedule-Based Construction Incentives, 87
Scheduling Method for Demand-Responsive Trans-

portation System, 1056
Time-Cost Trade-off Among Related Activities, 90
Weather in Construction Contracts, 76

Scour

Effects of Air Entrainment on Plunge Pool Scour, 573
Model Test Results of Scour Along Breakwaters, 1129
Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136
Response of Marine Pipelines in Scour Trenches, 1155
Scour-Depth Prediction Under Armoring Conditions, 633
Sines Revisited, 1145
Scouring
Note on Nearshore Ice Gouge Depths in Alaskan Beaufort Sea, 137
Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136
Sediment Transport Modeling, 1331

Screens

Free-Surface Flow Through a Screen, 630

Sea floor

Classification of Marine Sediments, 447
Note on Nearshore Ice Gouge Depths in Alaskan Beaufort Sea, 137
Note on New Ice Gouge Events in Alaskan Beaufort Sea, 136
Seabed Stability Near Floating Structures, 1168
Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146

Sea walls

Maximum Periodic Wave Run-up on Smooth Slopes, 1167
A Seawall for Sea Mammals, 1183

Sealants

Combined Stress Behavior of Structural Glazing Joints, 858

Sealing

Test Embankment Dam of Fracture Grouting, 541

Seasonal variations

Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216

Secondary flow

Secondary Flow in Mildly Sinuous Channel, 567
Thermally Induced Density Currents in Nonrectangular Sidearms, 628
Velocity Redistribution in Meandering Rivers, 611

Secondary systems

Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357

Sediment

Approximate Dynamic Lake Phosphorus Budget Models, 190
Classification of Marine Sediments, 447
Comparison: US P-61 and Delft Sediment Samplers, 654
Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154

- Considerations for Capping Subaqueous Dredged Material Deposits, 1169
- Effect of Sediment Density on Bed Load Transport, 556
- Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699
- Hydrologic Approach to Prediction of Sediment Yield, 581
- Modeling Mixed Sediment Suspended Load Profiles, 594
- Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641
- Prediction of Sediment Sampling Error at Nozzle, 653
- Static Equilibrium Bays: New Relationships, 1142
- Storing Sediment and Freeing Fish, 1258
- Turbulence Characteristics of Sediment-Laden Flow, 595
- Sediment concentration**
- Modeling Mixed Sediment Suspended Load Profiles, 594
- Sediment deposits**
- Sediment Entrainment and Deposition Measurements in Long Island Sound, 8
- Sediment Transport Modeling, 1331
- Sediment load**
- Applicability Index for Sand Transport Equations, 644
- Scour-Depth Prediction Under Armoring Conditions, 633
- Velocity Distribution in Open Channel Flow, 585
- Sediment production**
- Sediment Transport Modeling, 1331
- Sediment transport**
- Applicability Index for Sand Transport Equations, 644
- Bed Waves Generated by Internal Waves in Alluvial Channels, 596
- Bed-Surface Size Changes in Gravel-Bed Channel, 592
- Cohesive Sediment Transport Part I: Process Description, 614
- Cohesive Sediment Transport Part II: Application, 615
- Comparison: US P-61 and Delft Sediment Samplers, 654
- Effect of Sediment Density on Bed Load Transport, 556
- Guide for Estimating Riverbed Degradation, 571
- Lake Michigan Diversion and Illinois Waterways, 1140
- Mathematical Modeling of Fluvial Sand Delivery, 1144
- Mobile-Bed Friction at High Shear Stress, 598
- Model for Calculating Bed Load Transport of Sediment, 555
- Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641
- Sediment Entrainment and Deposition Measurements in Long Island Sound, 8
- Sediment Entrainment in Channel with Rippled Bed, 569
- Sediment Transport Modeling, 1331
- Twenty-first Coastal Engineering Conference, 1340
- Universal Bank Erosion Coefficient for Meandering Rivers, 593
- Width of Straight Alluvial Channels, 568
- Sediment yield**
- Hydrologic Approach to Prediction of Sediment Yield, 581
- Mathematical Modeling of Fluvial Sand Delivery, 1144
- Sedimentation**
- Calculation of Bed Variation in Alluvial Channels, 572
- Cohesive Sediment Transport Part I: Process Description, 614
- Cohesive Sediment Transport Part II: Application, 615
- Lake Michigan Diversion and Illinois Waterways, 1140
- Mathematical Modeling of Fluvial Sand Delivery, 1144
- Sediment Entrainment in Channel with Rippled Bed, 569
- Sediment Transport Modeling, 1331
- Sedimentation tanks**
- Modeling for Class-I Sedimentation, 214
- Seepage**
- Automatic Generation of Seepage Flow Nets by Finite Element Method, 119
- Critical Filters for Impervious Soils, 498
- Diagnostic Model of Dispersion in Porous Media, 562
- Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208
- Dynamics of Saturated Rocks. I: Equations of Motion, 323
- Evaluation of Deep Pumping Tests, 484
- New Drain Flow Formula, 675
- Nonlinear Steady State Seepage into Drains, 685
- Seepage and Contraction Joints in Concrete Canal Linings, 686
- Simple Groundwater Laboratory Models, 597
- Steady Drainage of Landfill Covers and Bottom Liners, 209
- Urban Groundwater Rise Control: Case Study, 702
- Seepage control**
- Grouting Trends, 1274
- Segmented elements**
- Box Segmentals: Refining Design, 1270
- Segmental Tunnel Lining Meets 'Buy American', 1269
- Seismic analysis**
- Dynamic Synthesis of Nonclassically Damped Substructures, 265
- Hysteretic Shear Model for Reinforced Concrete Members, 793
- Modified Frequency-Domain Data Processing, 408
- Seismic Engineering: Research and Practice, 1332
- Seismic design**
- Assessment of Seismic Structural Damage, 916
- Composite Action in Eccentrically Braced Frames, 909

Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785

Control Systems of Building Structures by Active Cables, 959

Cyclic Behavior of Double Angle Connections, 852

Design Method for Bridges on Lead-Rubber Bearings, 966

Earthquake Simulator Testing of Concentric Braced Dual System, 899

Impact of Earthquakes on Cantilever Retaining Walls, 939

Inelastic Behavior of Concrete Masonry Shear Walls, 918

Isolated Examples, 1284

Limitations of Type II Models for Seismic Hazard, 844

R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863

Seismic Behavior of Concentrically Braced Frame, 897

Seismic Behavior of Eccentrically Braced Steel Building, 898

Seismic Codes: Preparing for the Unknown, 1285

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Seismic Engineering: Research and Practice, 1332

Seismic Failure Rates of Multistory Frames, 802

Seismic Response of Imperial County Services Building in 1979, 971

Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Seismic effects

Assessment of Seismic Structural Damage, 916

Impact of Earthquakes on Cantilever Retaining Walls, 939

Pseudodynamic Test Method—Current Status and Future Directions, 913

Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917

Seismic Failure Rates of Multistory Frames, 802

Seismic Risk Analysis of Buried Pipelines, 1031

Seismic hazard

Connections Between Precast Elements—Failure Within Connection Region, 976

Earthquake Load for Structural Reliability, 873

Experimental Behavior of Dual Steel System, 796

Limitations of Type II Models for Seismic Hazard, 844

Orchestral Maneuvers, 1197

Seismic Codes: Preparing for the Unknown, 1285

Seismic Risk Analysis of Buried Pipelines, 1031

Seismic investigations

The Great Quake: On Site Reports, 1287

Measurement and Description of Tensile Fracture in Granite, 382

Ray-Path Curvature in Shallow Seismic Investigations, 516

Seismic response

Analytical Evaluation of K-Braced Structure Seismic Test, 902

Analytical Modeling of Phase 2 Steel Structure, 903

Composite Action in Eccentrically Braced Frames,

909

Design Method for Bridges on Lead-Rubber Bearings, 966

Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349

Earthquake Simulator Testing of Concentric Braced Dual System, 899

Experimental Digital Control of Structures, 339

Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Frequency Response Functions, 868

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Earthquake Responses, 869

Impedance Functions and Input Motions for Embedded Square Foundations, 473

Inelastic Torsional Response of a Single Story Framed Structure, 373

Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912

Seismic Analysis of Multistory Building Systems Using Microcomputers, 101

Seismic Behavior of Eccentrically Braced Steel Building, 898

Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Seismic Interaction of Structures and Soils: Stochastic Approach, 841

Seismic Performance of Steel Frames with Inverted V Braces, 907

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Seismic Response of Imperial County Services Building in 1979, 971

Seismic Response of Low-Rise Steel Frames, 820

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Sensitive Strata in Bootlegger Cove Formation, 514

Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Simplified Evaluation of Added Hydrodynamic Mass for Intake Towers, 348

Seismic simulation

Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917

Seismic studies

Geologic Characterization of Seismic Sources, Moving into the 1990s, 3

Seismic tests

Earthquake Simulator Testing of Concentric Braced Dual System, 899

Ray-Path Curvature in Shallow Seismic Investigations, 516

Seismic Behavior of Eccentrically Braced Steel Building, 898

Seismic waves

Antiplane Earthquake Waves in Long Structures, 428

Seismic Waves in Buildings with Shear Walls Or Central Core, 427

Simulation of Seismic Ground Motion Using Stochastic Waves, 430

Seismology

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Seismic Engineering: Research and Practice, 1332

Selection

Shopping for Better Project Management, 1175

Selenium

Agricultural Drainage Water—How Should it be Regulated in California?, 657

Economics of Selenium Removal from Drainage Water, 662

Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659

Selenium in Arid and Semi-arid Soils, 661

Semi-rigid connections

Semi-Rigid Steel Beam-to-Column Connections: Data Base and Modeling, 791

Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964

Sensitivity analysis

Least-Square Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874

Parametric Sensitivity in First Order Reliability Theory, 361

Predesign Planning for Parking Facilities, 759

Pressure and Flow Uncertainty in Water Systems, 1085

Sensitivity Study of Detention Basins in Urbanized Watershed, 1069

Sensors

Strategic Defense Initiative Six Years Later in the Army, 30

Separation

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Effect of Solids Property on Rates of Solids Dislodgment, 141

Separation techniques

Variable Injection Active-Pulse Air Classification, 164

Separators

Variable Injection Active-Pulse Air Classification, 164

Septic tanks

Big Trouble in Little America, 1249

Serviceability

Behavior of Concrete Structures in Service, 787

Bus-Ride Panel Rating of Pavement Serviceability, 1027

Crack Control in Beams Using Deformed Wire Fabric, 945

Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Settlement analysis

Analytical Approach for Evaluation of Settling Column Data, 168

Building Response to Excavation-Induced Settlement, 446

Consolidation of Sensitive Clay as Phase Change Process, 527

Distortion of Steel Tanks Due to Settlement of Their Walls, 495

Load Redistribution in Frame with Settling Footings, 106

Loads on a Rigid Box Buried in a Nonlinear Medium, 1046

Settlement control

Construction and Performance of Two Large Rockfill Embankments, 544

Settlers

Modeling for Class-I Sedimentation, 214

Settling velocity

Cohesive Sediment Transport Part I: Process Description, 614

Sewage disposal

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Sewage effluents

Axial Dilution in Obstructed Round Buoyant Jet, 553

Sewage treatment

Particle Filtration for Wastewater Irrigation, 693

Sewage treatment plants

Buying Tomorrow's Water, 1216

Sewer design

Storm Drain Design: Diffusive Flood Routing for PCs, 617

Toward a New Rational Method, 622

Sewer pipes

Optimum Design of Large Sewer Networks, 213

Sewers

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Big Trouble in Little America, 1249

Hydraulic Engineering, 1322

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Storm Drain Design: Diffusive Flood Routing for PCs, 617

Water Beneath the City Streets, 1251

Shaft spillways

Hood Characteristics for Siphon-Shaft Spillways, 588

Shafts

Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435

Shake table tests

Earthquake Simulator Testing of Concentric Braced Dual System, 899

Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Shale

Fissure Parameters in Stiff Clays Under Compression, 518

Shallow foundations

Upgrading Footings in Sand with Bored Piles, 546

SUBJECT INDEX

Shelf angles

Shallow water

Turbulent Surface Jet in Channel of Limited Depth, 646

Shape

Breakwater Choices, 1243

Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367

Particle Size and Shape Effects on Adsorption Rate Parameters, 143

Structural Control by Temporal Finite Elements, 35

Shear

Analytical Model for Shear Slip of Cracked Concrete, 831

Hysteretic Shear Model for Reinforced Concrete Members, 793

Influence of Cementation on Liquefaction of Sands, 507

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Shear Connector Design for Composite Flexural Members, 814

Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854

Shear deformation

Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343

A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338

Shear flow

Splitting Induced by Shear Connectors in Composite Beams, 806

Surface Thermal Plume in Channel, 600

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Shear forces

Elastic Design Charts of Stiffened Coupled Structural Walls, 801

Shear lag

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Shear modules

Further Studies on Elastic Properties of Douglas Fir, 770

Shear modulus

Ray-Path Curvature in Shallow Seismic Investigations, 516

Shear strength

Deformation Characteristics of Reinforced Sand in Direct Shear, 509

Discrete Numerical Model for Soil Mechanics, 467

Fatigue Behavior of Composite Metal Deck Slabs, 790

Nonlinear Failure Envelope for Soils, 479

Response of Masonry Bed Joints in Direct Shear, 922

Sensitive Strata in Bootlegger Cove Formation, 514

Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486

Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487

Strain Increment and Stress Directions in Torsion Shear Tests, 524

Surficial Stability of Compacted Clay Slopes, 478

Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Yield Function for Soil with Anisotropic Fabric, 267

Shear stress

Alternate Analysis of Pressuremeter Test, 548

Analytical Model for Shear Slip of Cracked Concrete, 831

Bed-Surface Size Changes in Gravel-Bed Channel, 592

Bottom Boundary Layer Under Nonlinear Wave Motion, 1127

Form Resistance in Gravel Channels with Mobile Beds, 570

Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456

Shear and Normal Stresses in Adhesive Joints, 415

Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334

Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577

Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Shear tests

Discrete Numerical Model for Soil Mechanics, 467

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487

Strain Increment and Stress Directions in Torsion Shear Tests, 524

Undrained Behavior of Clay Under Cyclic Shear Stresses, 500

Shear walls

Finite Element Modeling of Wood Diaphragms, 817

Inelastic Behavior of Concrete Masonry Shear Walls, 918

Seismic Waves in Buildings with Shear Walls Or Central Core, 427

Stiffened Coupled Shear Walls, 305

Shear waves

Dynamics of Saturated Rocks. II: Body Waves, 324

Sheaves

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Sheet piling

Evaluation of New Concepts for Cellular Structure Construction, 61

Sheets

Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Shelf angles

Shelf Angles for Masonry Veneer, 815

Shell structures

Axisymmetric Vibrations of Reinforced Orthotropic

- Shallow Spherical Caps, 34
- Buckling Analysis of Segmented Conical Concrete Shell Roof, 877
- Buckling Behavior of Pressure Loaded Cylindrical Panels, 283
- Effect of Initial Imperfections on Dynamic Buckling of Shells, 328
- Elastic Stability of Cylindrical Shells with Weld Depressions, 860
- Elastic Stability of Lap-Jointed Cylinders, 825
- Limit State Analysis of Masonry Domes, 837
- Lunar Structures Generated and Shielded with On-site Materials, 31

Shells

- Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
- Buckling Analysis of Segmented Conical Concrete Shell Roof, 877
- Creep Buckling of Cylindrical Shell Under Variable Loading, 327
- Nondestructive Load Predictions of Concrete Shell Buckling, 857
- A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338
- Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854

Shipping

- Panama Canal: Its Past and Its Future, 249

Ships

- Influence of Vessel Movements on Stability of Restricted Channels, 1153

Shoaling

- Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Shores

- Estimating Terminal Lake Level Frequencies, 1091

Shrinkage

- Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
- Behavior of Concrete Structures in Service, 787
- Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856
- Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824
- Segmental Box Girder: Deflection Probability and Bayesian Updating, 937
- Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Sideways

- Nonlinear Effects on Shakedown of Sideway Frames, 798

Signals

- Effect of Platoons on Permissive Left-Turn Capacity: Pilot Study, 1029
- Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036

Signs

- Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036

Silica

- Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772
- Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Silicates

- Combined Stress Behavior of Structural Glazing Joints, 858

Silos

- Bending of Multi-Bin RC Cylindrical Silos, 977
- Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59
- Elastic Stability of Cylindrical Shells with Weld Depressions, 860
- Elastic Stability of Lap-Jointed Cylinders, 825
- Restoring an Impaired Concrete Silo, 46

Silts

- Critical Filters for Impervious Soils, 498
- Investigation of Crushed Rock Filters for Dam Embankment, 468

Simple shear tests

- Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481
- Cyclic Behavior of Clays in Undrained Simple Shear, 482

Simulation

- Estimating Terminal Lake Level Frequencies, 1091
- Improving Water Delivery System Operation Using Training Simulators, 1110
- Modeling of Dynamic Systems: An Innovative Approach, 111
- Modeling Yields from Rainfall and Supplemental Irrigation, 677
- Simulating Construction Robot Agents and Their Knowledge Environment, 121
- Simulation of Seismic Ground Motion Using Stochastic Waves, 430
- Simulation of Wind-Induced Water Currents, 616
- Storage of Heated Water in Underground Openings, 480
- Structural System Reliability Using Linear Programming and Simulation, 931
- System Reliability Under Time Varying Loads: I, 312

Simulation models

- Decision Support for Estuarine Water Quality Management, 1120
- Expert System for Calibrating SWMM, 1089
- Finite Element Modeling of Left Ventricle, 375
- Freeway Surveillance and Control System Using Simulation Model, 1043
- Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
- Impact Analyses of Construction of Kansai International Airport, 1062
- Irrigation and Drainage Strategies in Salinity-Affected Regions, 679
- Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045
- Modeling Dynamic Occupant Loads, 875
- Network Flow Algorithm Applied to California

SUBJECT INDEX

Slurry pipelines

Aqueduct Simulation, 1080
Optimization Model for Water Distribution System Design, 632
Optimization of Imperfection-Sensitive Structures, 366
Simulating Activity Chains: German Approach, 1037
Water Rights Modeling and Analysis, 1097
Water-Quality Management Through Combined Simulation-Optimization Approach, 201
Sinkholes
Stabilizing a 'Mann'-Sized Sinkhole, 1290
Sinuosity
Secondary Flow in Mildly Sinuous Channel, 567
Siphons
Hood Characteristics for Siphon-Shaft Spillways, 588
Site evaluation
Assessing Site Assessments, 1273
Cap Stabilization for Reclaimed Uranium Sites, 443
Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172
Using Fish-Eye Lens for GPS Site Reconnaissance, 1007
Site selection
Considerations for Capping Subaqueous Dredged Material Deposits, 1169
Efficient Land Allocation, 1065
Size
Breakwater Choices, 1243
Glitches in Flitch Beam Design, 1260
Size effect
Bed-Surface Size Changes in Gravel-Bed Channel, 592
Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371
Particle Size and Shape Effects on Adsorption Rate Parameters, 143
Setting Stresses in Polymer Composites with Multiple-Size Particles, 784
Size Effects on Strength, Toughness and Ductility, 347
Skin friction
Dynamic Skin-Friction Effects on Buried Arches, 893
Skin Friction of Driven Piles in Calcareous Sands, 453
Soil-Sheet Pile Interaction in Vibro-Piling, 506
Slabs
Analytical Solution to Free Vibration of Sector Plates, 429
Concrete Lunar Base Investigation, 22
Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785
Fatigue Behavior of Composite Metal Deck Slabs, 790
R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
Slenderness ratio
Cyclic Response of Concrete Bracing Members, 788

Inelastic Buckling of Reinforcing Bars, 262
Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
Sliding
Sinusoidal Forced Vibration of Sliding Masonry System, 891
Slip
Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
Boundary Conditions for Planar Granular Flows, 341
Finite Element Model for Curved Embedded Reinforcement, 308
Slope stability
Geosynthetic Reinforced Soil Structures, 528
Slopes
Surficial Stability of Compacted Clay Slopes, 478
Sludge
Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157
Development and Design of Sludge Freezing Beds, 189
Down on the Farm, 1198
Sludge Ash as Lightweight Concrete Material, 144
Sludge in the Nineties, 1246
Sludge digestion
Sludge Ash as Lightweight Concrete Material, 144
Sludge Digestion by Anaerobic Fluidized Beds:
I—Lab Performance Data, 211
Sludge Digestion by Anaerobic Fluidized Beds:
II—Kinetic Model, 212
Sludge disposal
Sludge in the Nineties, 1246
Sludge drying
Sludge Ash as Lightweight Concrete Material, 144
Sludge treatment
Down on the Farm, 1198
Sludge Ash as Lightweight Concrete Material, 144
Sludge Digestion by Anaerobic Fluidized Beds:
I—Lab Performance Data, 211
Sludge Digestion by Anaerobic Fluidized Beds:
II—Kinetic Model, 212
Sludge in the Nineties, 1246
Slump
Analytical Study on Deformation of Fresh Concrete, 293
Slurries
Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639
Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640
Slurry pipelines
Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639
Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640
Slurry walls

Field Performance of Structural Slurry Wall, 454

Small business

Productivity Database and Job Cost Control Using Microcomputers, 98

Small structures

Small-Scale Model Tests of Structural Steel Assemblies, 906

Snow

Cold Regions Engineering, 1308

Designing Structures for Snow Loads, 804

Snow loads

Designing Structures for Snow Loads, 804

Snow roads

Binders for Snow Roads and Runways in Antarctica, 131

Social aspects

Gaining Support for Direct Potable Water Reuse, 233

Social communication

The Elusive Engineering Style, 257

Training Expatriate Engineering Professionals, 755

Social impact

Deck Park Covers Phoenix Freeway, 1184

Engineers Legislative Alliance of Wisconsin (ELAW), 256

Impact Analyses of Construction of Kansai International Airport, 1062

Impact Evaluation Procedures: Theory, Practice, and Needs, 1070

Property-Value Guarantees for Waste Facilities, 1068

Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072

Top Projects for 1989, 1240

Social needs

Affordable Housing: a Challenge to Civil Engineers, 1297

Education—Key to Dealing with Social and Environmental Objectives, 1073

Hydraulic Engineering: Global Challenge, 599

Impact Evaluation Procedures: Theory, Practice, and Needs, 1070

Method to Deal with DBE Issues, 248

Technology, Society, and Water Management, 1074

Social values

Organizational Culture: Implications for Management, 743

Technology, Society, and Water Management, 1074

What is an "Ethical" Engineer?, 763

Socioeconomic data

Impact Analyses of Construction of Kansai International Airport, 1062

Sociological factors

Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250

Impact Analyses of Construction of Kansai International Airport, 1062

Sodium

Modeling Sodium and Chloride in Surface Streams

During Base Flows, 177

Soft soils

Channel Tunnel, Texas Style, 1286

Consolidation of Sensitive Clay as Phase Change Process, 527

Stability Analysis of Embankments on Soft Ground, 458

Softening

Characteristics and Computational Procedure in Softening Plasticity, 364

Measurement of Characteristic Length of Nonlocal Continuum, 309

A Self-Adaptive Model for Structural Softening of Brittle Materials, 358

Soil

Analytical Model for Longitudinal Soil Vibration, 463

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Load Redistribution in Frame with Settling Footings, 106

Soil analysis

Knowledge-Based System for Soil Improvement, 118

Soil cement

Cementation Effects in Frictional Materials, 523

Simulating Effect of Channel Changes on Stream Infiltration, 649

Soil classification

Classification of Marine Sediments, 447

Soil compaction

New Basis for Earthwork Specification for Clay Soil, 537

Relative Compaction of Fill Having Oversize Particles, 530

Reliability Model for Soil Liners: Initial Design, 483

Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470

Soil compressibility

1D Strain in Normally Consolidated Cohesive Soils, 485

Soil deformation

Nonisothermal Consolidation in Unsaturated Soil, 522

Soil dilatancy

Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470

Soil dynamics

Analytical Model for Longitudinal Soil Vibration, 463

Ray-Path Curvature in Shallow Seismic Investigations, 516

Vertical Vibration of Machine Foundations, 449

Volume Change Behavior of Vibrated Sand Columns, 462

Soil gradation

Filtration of Broadly Graded Cohesionless Soils, 547

Soil, layered

SUBJECT INDEX

Soils

Water Movement in Horizontally Layered Soils, 690

Soil layers

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

New Drain Flow Formula, 675

Universal Bank Erosion Coefficient for Meandering Rivers, 593

Soil liquefaction

Design Problems in Soil Liquefaction, 17

Soil mechanics

Arch in Soil Arching, 469

Cyclic Axial Loading Analysis of Piles in Sand, 493

Discrete Numerical Model for Soil Mechanics, 467

Downdrag Forces in Group of Piles, 491

Geostatic Wall Pressures, 519

Impedance Functions and Input Motions for Embedded Square Foundations, 473

Random Nature of Soil Porosity and Related Properties, 332

Reliability of Offshore Foundations: State of the Art, 455

Soil penetration resistance

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501

Soil permeability

On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716

Soil porosity

Random Nature of Soil Porosity and Related Properties, 332

Soil pressure

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Soil properties

Alternate Analysis of Pressuremeter Test, 548

Average Property in Random Two-State Medium, 269

The History of Frost Research in Minnesota, 134

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Screening of Groundwater Contaminants by Travel-Time Distributions, 170

Soil resistance

Pipe-Soil Interaction Model, 1137

Soil Resistances to Embedded Anchor Chain in Soft Clay, 526

Soil sampling

Energy Transfer Mechanism in SPT, 521

Soil science

Research Imperatives for Irrigation Science, 689

Soil settlement

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Consolidation of Sensitive Clay as Phase Change Process, 527

Model Tests of Gravity Platforms: Interpretation, 534

Soil, shear strength

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470

Soil stability

Seabed Stability Near Floating Structures, 1168

Soil strength

Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023

Pipe-Soil Interaction Model, 1137

Soil stresses

Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470

Soil structure

Geosynthetic Reinforced Soil Structures, 528

Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497

Probabilistic Potentiometric Surface Mapping, 535

Yield Function for Soil with Anisotropic Fabric, 267

Soil tests

Interpretation Procedure for Pressuremeter Tests in Sand, 538

Relative Compaction of Fill Having Oversize Particles, 530

Soil treatment

Augering Answers, 1289

Knowledge-Based System for Soil Improvement, 118

Soil water

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Diatomaceous Soils: A New Approach, 1191

Factors Influencing Thermal Resistivity of Sands, 543

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716

Soil-pile interaction

Soil-Sheet Pile Interaction in Vibro-Piling, 506

Validity of Smith Model in Pile Driving Analysis, 517

Soil-pipe interaction

Analysis and Design of RPM and Other Composite Underground Pipelines, 1030

Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023

Pipe-Soil Interaction Model, 1137

Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Soils

Centrifuge Study of Faulting Effects on Tunnel, 499

Improvements in Soil Absorption Trench Design, 193

Knowledge-Based System for Soil Improvement, 118

Modeling Solute Transport by Centrifugation, 171

Nonlinear Failure Envelope for Soils, 479

PCE Volatilized from Stagnant Water and Soil, 215

Reliability Model for Soil Liners: Initial Design, 483

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Selenium in Arid and Semi-arid Soils, 661

Soils, saturated

Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539

Saturated Clay Response During Braced Cut Construction, 505

Soils, unsaturated

Modeling of Enhanced Biodegradation in Unsaturated Soil Zone, 150

Nonisothermal Consolidation in Unsaturated Soil, 522

Soil-structure interaction

Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110

Boundary Element Methods in Structural Analysis, 1302

Centrifuge Study of Faulting Effects on Tunnel, 499

Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378

Dynamic Skin-Friction Effects on Buried Arches, 893

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Frequency Response Functions, 868

Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Earthquake Responses, 869

Response of Buried Cylinders to Surface Loads, 1

Seabed Stability Near Floating Structures, 1168

Seismic Interaction of Structures and Soils: Stochastic Approach, 841

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Steady State Vibration of Subway-Soil-Building System, 270

Torsional Response of Symmetric Structures, 277

Solar radiation

Effect of Pond Depth on Bacterial Mortality Rate, 198

Solid waste disposal

Characterization of MSW Incinerator Ash, 167

Solid waste management

The Battle Over Burning, 1238

Environmental Engineering Infrastructure: Problems and Needs, 225

Solid wastes

Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207

Solidification

Consolidation of Sensitive Clay as Phase Change Process, 527

Solidification Theory for Concrete Creep—I. Formulation, 368

Solidification Theory for Concrete Creep II. Verification and Application, 369

Solids

Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157

Effect of Solids Property on Rates of Solids Dislodgment, 141

Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639

Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640

Solitary wave

Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146

Solubility

Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211

Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212

Solutes

Modeling Solute Transport by Centrifugation, 171

Solute Movement Through Root-Soil Environment, 703

Solvents

Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186

Sorption

Models of Sorptive Toxic Substances in Freshwater Systems. I. Basic Equations, 13

Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14

South America

Water and Urban Land-Use Planning in Cali, Colombia, 1119

South Carolina

New Piers for an Old Bridge, 1190

Space exploration

Dependence of Lunar Bases on Phobos and Deimos, 39

Hydraulic Engineering: Global Challenge, 599

Space frames

Space Station Structure Modal Selection Criteria, 23

Space structures

Active Control of Flexural Vibrations in Beams, 33

Continuum Models of Space Station Structures, 40

Dependence of Lunar Bases on Phobos and Deimos, 39

Space Station Structure Modal Selection Criteria, 23

Space truss

Dynamic and Static Behavior of Cable Dome Model, 807

Modification of Behavior of Double-Layer Grids: Overview, 847

Post-Buckling Analysis of Steel Space Trusses, 839

Spacing

Upgrading Footings in Sand with Bored Piles, 546

Spalling

Freeze-Thaw Deterioration of Concrete Pavements, 776

Spatial analysis

Mapping and Synthesis of Random Pressure Fields, 407

Spatial data

Correlated Versus Uncorrelated Hydrologic Samples, 1116

Probabilistic Potentiometric Surface Mapping, 535

Spatial distribution

Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022

Spatial Action of Straight Gravity Dams in Narrow Valleys, 826

Specific yield

Chance-Constrained Model for Management of Stream-Aquifer System, 1088

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Specifications

Design Interaction Equation for Steel Beam-Columns, 859

Design Interaction Equations for Steel Members, 885

Direct Land Grading Design of Irrigation Plane Surfaces, 680

Does Civil Engineering Need System Engineering?, 227

Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892

Meeting the Quality Management Issue on Highway Construction, 234

New Basis for Earthwork Specification for Clay Soil, 537

Unbonded Performance, 1275

Spectra

Effective Length Spectra for Cross Bracings, 972

Study of Inelastic Spectra With High Damping, 871

Wave Envelope and Related Spectra, 1157

Spectral density function

Wave Envelope and Related Spectra, 1157

Spheres

Spheroidal Cavity with Prescribed Asymmetric Tractions in Three-Dimensional Transverse Isotropy, 10

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331

Spherical Shells

Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Spillways

Design of Efficient Side-Channel Spillway, 624

Experiments in Side-Channel Spillways, 587

Finite Analytic Solution of Flow Over Spillways, 425

Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612

Mechanics of Overflow Erosion on Embankments: Part II. Hydraulic and Design Considerations, 613

Search for the Cause of High-Speed-Channel Revetment Failures, 50

Spillway Discharge Calculations in NWS DAMBRK, 607

Splitting

Splitting Induced by Shear Connectors in Composite Beams, 806

Spreadsheets

Expert System for Evaluating and Notifying Hazardous Waste Generators, 108

Modeling of Dynamic Systems: An Innovative Approach, 111

Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117

Sprinkler irrigation

Equations Describing Sprinkler Droplet Velocity, 670

Sprinklers

Equations Describing Sprinkler Droplet Velocity, 670

Two Roof Failures Due to Water Ponding and Related Code Requirements, 53

Stability

Buckling Behavior of Pressure Loaded Cylindrical Panels, 283

Buckling of Three-Dimensional Rigid-Link Model, 271

Characteristics and Computational Procedure in Softening Plasticity, 364

Curved Beam Elements for Nonlinear Analysis, 314

Design Interaction Equation for Steel Beam-Columns, 859

Design Interaction Equations for Steel Members, 885

Elastic Stability of Cylindrical Shells with Weld Depressions, 860

Exact or Lower Bound Tapered Column Buckling Loads, 851

Filtration of Broadly Graded Cohesionless Soils, 547

Geostatic Wall Pressures, 519

Hysteretic Column Under Earthquake Excitations, 264

Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135

Influential Mode of Imperfection on Carrying Capacity of Structures, 397

Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956

Interfacial Stability in Stratified Channel Flows, 619

Load-Shortening Relationships for Bars, 889

Optimization of Imperfection-Sensitive Structures, 366

P-Delta Analysis of Building Structures, 830

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Reliability of Randomly Imperfect Beam-Columns, 403

Scheme for Elastics with Snap-Back and Looping, 398

Seabed Stability Near Floating Structures, 1168

Sensitive Strata in Bootlegger Cove Formation, 514

Stability Functions for Three-Dimensional Beam-Columns, 813

Stability of Frictional Materials, 376

Stability of Pretwisted Bars with Various End Torques, 304

Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331

Static Equilibrium Bays: New Relationships, 1142

Steel Structures, 1334

Surficial Stability of Compacted Clay Slopes, 478

Tapered Box Columns Under Biaxial Loading, 888

Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803

Viscoelastic Stability of Columns on Continuous Support, 354

Water Movement in Horizontally Layered Soils, 690

Stability analysis

Buckling Analysis of Segmented Conical Concrete Shell Roof, 877

Elastic Stability of Lap-Jointed Cylinders, 825

Geosynthetic Reinforced Soil Structures, 528

Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Surficial Stability of Compacted Clay Slopes, 478

Stabilization

Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157

Cap Stabilization for Reclaimed Uranium Sites, 443

Effect of Pond Depth on Bacterial Mortality Rate, 198

Evaluation of Admixture Stabilization for Problem Laterite, 1059

Properties of Solid Waste Incinerator Fly Ash, 508

Stabilizing a 'Mann'-Sized Sinkhole, 1290

Stadiums

Building the Perfect Playpen, 1281

Domed Renovations, 1257

Standard penetration tests

Energy Transfer Mechanism in SPT, 521

Standardization

List of Sea-State Parameters, 1172

Standards

Impact of Professional Practice Standards on Liability of Engineers, 754

Knowledge-Based Standard-Independent Member Design, 870

Prager-Shield Optimality Criteria for Linear Segmentation, 273

Progressive Collapse: U.S. Office Building in Moscow, 44

Space Station Structure Modal Selection Criteria, 23

Wind Design Problems with Building Structures During Construction, 29

State government

Regionalization in Water Supply Industry: Status and Needs, 1094

State-of-the-art reviews

Heat-Straightening of Steel: Fact and Fable, 952

In Situ Hydraulic Conductivity Tests for Compacted Clay, 512

Reliability Analysis of Water Distribution Systems, 1328

Traffic Platoon Dispersion Modeling, 1028

Static loads

Exact Method for Static Analysis of Periodic Structures, 288

Point Loads in Cross-Anisotropic Layered Half-spaces, 294

Response of Masonry Bed Joints in Direct Shear, 922

Static structural analysis

Exact Method for Static Analysis of Periodic Structures, 288

Lessons from Explosive Tests on RC Buried Arches, 833

Modified Dynamic Condensation Method, 800

Shakedown of Grids Under Combined Bending and Torsion, 961

Static tests

Bending of Circular Plates Supported at Number of Points, 289

Inelastic Behavior of Concrete Masonry Shear Walls, 918

Statics

Bending of Circular Plates Supported at Number of Points, 289

Statistical analysis

Complex Envelope of Surface Gravity Waves, 1166

Statistical analysis

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Characteristics and Spatial Variability of Droughts in Idaho, 666

Checking Flood Frequency Curves Using Rainfall Data, 583

Cluster Analysis as Applied to Regional Flood Frequency, 1107

Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121

Density Tests Above Zero Air Voids Line, 502

Estimating Probabilities of Extreme Rainfalls, 643

Extreme Thermal Loadings in Highway Bridges, 887

Groupiness Factor and Wave Height Distribution, 1131

Improved Filter Criterion for Cohesionless Soils, 450

Method to Deal with DBE Issues, 248

Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38

Modeling Dynamic Occupant Loads, 875

New Plotting Position Formula for Pearson Type-III Distribution, 591

Predicting Reaeration Rates in Texas Streams, 178

Probabilistic Potentiometric Surface Mapping, 535

Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580

River Quality Modeling: Time Domain Approach, 707

Statistics-Based Approach to Wastewater Treat-

ment Plant Operations, 180

Statistical distributions

New Plotting Position Formula for Pearson Type-III Distribution, 591

Statistical models

Simulation Models of Sequences of Dry and Wet Days, 684

Water Supply Yield Analysis for the Washington Metropolitan Area, 1086

Statistics

Variability of Empirical Flow Quantiles, 554

Steady state

Inhibitory Substrate Utilization by Steady-State Biofilms, 158

Nonlinear Steady State Seepage into Drains, 685

Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525

Verification of Kirkham's Problem of Layered Soil Drainage, 696

Steady state models

Models of Sorptive Toxic Substances in Freshwater Systems. I: Basic Equations, 13

Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14

Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15

Steel

Ashland Tank Collapse Investigation, 51

Beam-Column Moment Connections for Composite Frames: Part 1, 957

Beam-Column Moment Connections for Composite Frames: Part 2, 958

Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970

Bells Under Bells, 1295

Design Interaction Equation for Steel Beam-Columns, 859

Distortion of Steel Tanks Due to Settlement of Their Walls, 495

Effective Length Factor for Columns in Unbraced Frames, 794

Experimental Study of Prestressed Composite Beams, 926

Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892

Glitches in Flitch Beam Design, 1260

Haunches and Hangers, 1199

Least-Weight Design of Steel Frameworks Accounting for $P-\Delta$ Effects, 874

New Roof for an Aging Temporary, 1276

Parking Garage Crisis, 1262

Post-Tensioned Transportation, 1272

Prestressed-Steel Continuous-Span Girders, 867

Pre-Tensioned and Posttensioned Composite Girders, 974

Semi-Rigid Steel Beam-to-Column Connections: Data Base and Modeling, 791

Simplified Second-Order Elastic-Plastic Analysis of Frames, 104

Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964

Superscraper, 1201

Thin-Walled Steel Box Columns Under Biaxial Loading, 948

Time-Dependent Analysis of Composite Steel-Concrete Sections, 947

Unbonded Performance, 1275

Steel beams

Analytical Study of Prestressed Composite Beams, 927

Behaviors of Steel and Composite Beams at Various Displacement Rates, 910

Guidelines for Flexural Design of Prestressed Composite Beams, 962

Pre-Tensioned and Posttensioned Composite Girders, 974

Steel columns

Bells Under Bells, 1295

New Roof for an Aging Temporary, 1276

Strength and Deformability of Steel Column Footing, 911

Steel frames

Composite Action in Eccentrically Braced Frames, 909

CSTRUCT: Computer Environment for Design of Steel Structures, 115

Haunches and Hangers, 1199

Microcomputer-Aided Analysis and Design of Steel Frames, 109

Recursive Optimization for Seismic Steel Frames, 812

Seismic Behavior of Eccentrically Braced Steel Building, 898

Seismic Performance of Steel Frames with Inverted V Braces, 907

Seismic Response of Low-Rise Steel Frames, 820

Shaking Table Tests of Pinned-Based Steel Gable Frame, 967

Uncertainties in Establishing Design Earthquakes, 5

Steel piles

Dynamic and Static Testing in Soil Exhibiting Set-Up, 501

Expressway Centerpiece, 1194

Steel plates

Restoring an Impaired Concrete Silo, 46

Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810

Steel structures

Analytical Evaluation of K-Braced Structure Seismic Test, 902

Analytical Modeling of Phase 2 Steel Structure, 903

Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908

Brace Fractures and Analysis of Phase I Structure, 904

Building Onto History, 1293

Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59

Cyclic Tests of Full-Scale Composite Joint Sub-assemblies, 905

Design Interaction Equations for Steel Members, 885

Earthquake Simulator Testing of Concentric Braced Dual System, 899

- Elastic and Plastic Designs for Maximum Load, 866
- Experimental Study of Prestressed Composite Beams, 926
- Heat-Straightening of Steel: Fact and Fable, 952
- Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Material Behavior and Optimum Design of Structural Systems, 849
- Quasi-Static Tests of Scaled Model Building, 900
- Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912
- Seismic Behavior of Concentrically Braced Frame, 897
- Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901
- Shakedown Analysis in Plastic Design of Steel Structures, 281
- Small-Scale Model Tests of Structural Steel Assemblies, 906
- Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964
- Steel Structures, 1334
- Strategies for Mitigating Damage to Metal Building Systems, 26
- Stiffeners**
- Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950
- Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892
- Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391
- Stiffening**
- Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Elastic Design Charts of Stiffened Coupled Structural Walls, 801
- Stiffened Coupled Shear Walls, 305
- Stiffness**
- Analysis of Multioutrigger-Braced Structures, 896
- Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823
- Behaviors of Steel and Composite Beams at Various Displacement Rates, 910
- Buckling of Three-Dimensional Rigid—Link Model, 271
- Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785
- Cyclic Response of Concrete Bracing Members, 788
- Cyclic Tests of Full-Scale Composite Joint Subassemblies, 905
- Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821
- Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378
- Effective Length Factor for Columns in Unbraced Frames, 794
- Effective Length Spectra for Cross Bracings, 972
- Elastic Stiffness of Flat Anchor Region at Cracked Geological Interface, 263
- Estimation of the Inelastic Longitudinal Abutment Stiffness of Bridges, 928
- Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391
- Five-Spring Element for Biaxially Bent R/C Columns, 809
- Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419
- Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942
- Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023
- Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
- Quasi-Static Tests of Scaled Model Building, 900
- R/C Beam-Column-Slab Subassemblies Subjected to Lateral Loads, 863
- Repair and Completion of Damaged Cooling Tower, 819
- Response of Masonry Bed Joints in Direct Shear, 922
- Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456
- Rocking Stiffness of Arbitrarily-Shaped Embedded Foundations, 471
- Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955
- Seismic Response of Low-Rise Steel Frames, 820
- Theoretical and Experimental Study of Regular Packings of Granules, 306
- Stiffness matrix**
- Beam-Column Element on Weak Winkler Foundation, 374
- Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
- Stability Functions for Three-Dimensional Beam-Columns, 813
- Stilling basins**
- Hydraulic Jump Type Stilling Basin for Low Froude Numbers, 609
- Stochastic models**
- Design of Wastewater Storage Ponds at Land Treatment Sites. 1: Parallels with Applied Reservoir Theory, 182
- Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183
- Equivalent Linearization Method in Nonlinear FEM, 292
- Hysteretic Column Under Earthquake Excitations, 264
- Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112
- Simulation of Seismic Ground Motion Using Stochastic Waves, 430
- Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694
- Stochastic process**
- Effect of Orbital A Priori Information on Baseline Determinations, 989
- Stochastic processes**
- Bounds on Response Variability of Stochastic Systems, 420
- Correlated Versus Uncorrelated Hydrologic Samples, 1116
- Equivalent Linearization Method in Nonlinear FEM, 292
- Irrigation and Drainage Strategies in Salinity-

SUBJECT INDEX

Stream function

- Affected Regions, 679
- Markov Chain Model for Cracking Behavior of Reinforced Concrete Beams, 914
- Response-Surface Approach for Reliability Analysis, 433
- Stochastic Finite Element Expansion for Random Media, 326
- Stochastic Stability of Bridges Considering Coupled Modes: II, 286
- Use of Stochastic Hydrology in Reservoir Operation, 683
- Stone columns**
- The Church on Stilts, 1221
- Storage**
- Analytical Model for Border Irrigation, 729
- Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183
- Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608
- Storage of Heated Water in Underground Openings, 480
- Storage tanks**
- Augering Answers, 1289
- Differential Settlements in Steel Tanks, 2
- Storm drains**
- Storm Drain Design: Diffusive Flood Routing for PCs, 617
- Storms**
- Model Tests of Gravity Platforms: Description, 533
- Stormwater**
- Selection of Stormwater Model Parameters, 153
- Stormwater Detention Basin Nutrient Removal Efficiency, 1075
- Stormwater management**
- Design of Urban Runoff Quality Controls, 1314
- Detention Pond Sizing for Multiple Return Periods, 589
- Expert System for Calibrating SWMM, 1089
- Stormwater Detention Basin Nutrient Removal Efficiency, 1075
- Water and Urban Land-Use Planning in Cali, Colombia, 1119
- Water Resources Planning and Management, 1342
- Strain**
- 1D Strain in Normally Consolidated Cohesive Soils, 485
- Analytical Study of Prestressed Composite Beams, 927
- Behavior of Concrete Structures in Service, 787
- Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808
- Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856
- Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418
- Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371
- Loading and Unloading Stress-Strain Curves for Brick Masonry, 944
- Model of Finite Strain Creep of Metals, 353
- Numerical Representation of Bodner Viscoplastic Constitutive Model, 276
- Saturated Clay Response During Braced Cut Construction, 505
- Size Effects on Strength, Toughness and Ductility, 347
- Strain Increment and Stress Directions in Torsion Shear Tests, 524
- Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
- Strain distribution**
- Size Effects on Strength, Toughness and Ductility, 347
- Strain energy**
- Contribution of Gaussian Curvature to Strain Energy of Plates, 350
- Strain gages**
- Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933
- Strain gauges**
- Pipeline Deformation Monitoring Using GPS Survey Techniques, 982
- Strain hardening**
- Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808
- Inelastic Buckling of Reinforcing Bars, 262
- Strain rate**
- Dynamic Triaxial Tests of High-Strength Concrete, 317
- FEM Dynamic Fracture Analysis of Concrete Beams, 396
- Rate-Dependent Material Model for Structural Steel, 291
- Strength Characteristics of Frozen Fox Gravel, 132
- Strain softening**
- Measurement of Characteristic Length of Nonlocal Continuum, 309
- Saturated Clay Response During Braced Cut Construction, 505
- Size Effects on Strength, Toughness and Ductility, 347
- Strategic planning**
- Action Versus Planning, 747
- Business Planning for New Engineering Consulting Firms, 742
- Managing to be Profitable in Design Business: A Case Study, 739
- Strategic Defense Initiative Six Years Later in the Army, 30
- Technology and Strategic Management in Construction, 740
- Stratified flow**
- Capped Water Intakes in a Stratified Crossflow, 563
- Geometry of Arrested Thermal Wedges, 1174
- Interfacial Mixing in Stratified Channel Flows, 601
- Interfacial Stability in Stratified Channel Flows, 619
- Internal Lee Waves in Turbulent Two-Layer Flow, 629
- Stream function**
- Improved Algorithm for Stream Function Wave

- Theory, 1133
- Stream gaging**
 Characteristics and Spatial Variability of Droughts in Idaho, 666
- Stream pollution**
 Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15
- Streambed armoring**
 Guide for Estimating Riverbed Degradation, 571
- Streambeds**
 River-Meander Model: I. Development, 635
 River-Meander Model: II. Applications, 636
- Streamflow**
 Routing Procedure for Ungaged Channels, 1079
- Streams**
 Chance-Constrained Model for Management of Stream-Aquifer System, 1088
 Measurement of Reaeration in Streams: Comparison of Techniques, 200
 Modeling Sodium and Chloride in Surface Streams During Base Flows, 177
 Open Channel Flow Through Transverse Floor Outlets, 678
- Strength**
 Analytical Study for Concrete Confinement in Tied Columns, 954
 Anisotropic Nature of Jointed Rock Mass Strength, 295
 Beam-Column Moment Connections for Composite Frames: Part 2, 958
 Brick Masonry: U.S. Office Building in Moscow, 43
 Connections Between Precast Elements—Failure Within Connection Region, 976
 Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772
 Cyclic Tests of Full-Scale Composite Joint Sub-assemblages, 905
 Design Interaction Equation for Steel Beam-Columns, 859
 Design Interaction Equations for Steel Members, 885
 Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942
 Material Behavior and Optimum Design of Structural Systems, 849
 Prestressed Concrete Beams with Opening Under Torsion and Bending, 949
 Stability Analysis of Embankments on Soft Ground, 458
 Strength and Deformability of Steel Column Footing, 911
 Strength and Porosity of Portland Cement Paste Subjected to Chloride Penetration, 769
 Width of Straight Alluvial Channels, 568
- Stress**
 Back Analysis of Rock Tunnel Using Boundary Element Method, 511
 Behavior of Concrete Structures in Service, 787
 Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856
 Influence of Cementation on Liquefaction of Sands, 507
 Loading and Unloading Stress-Strain Curves for Brick Masonry, 944
 Nonisothermal Consolidation in Unsaturated Soil, 522
 Numerical Representation of Bodner Viscoplastic Constitutive Model, 276
 A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338
 Prestressed-Steel Continuous-Span Girders, 867
 Recursive Optimization for Seismic Steel Frames, 812
 Setting Stresses in Polymer Composites with Multiple-Size Particles, 784
 Simple Mean Free Path Theory for Stresses in a Rapid Granular Flow, 340
 Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384
 Strain Increment and Stress Directions in Torsion Shear Tests, 524
 Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297
 Stress, Vibration and Buckling of Multilayered Cylinders, 789
 Structural Analysis of Bimodular Materials, 322
- Stress analysis**
 Response-Surface Approach for Reliability Analysis, 433
- Stress concentration**
 Influence of Cementation on Liquefaction of Sands, 507
 Shear and Normal Stresses in Adhesive Joints, 415
 Spheroidal Cavity with Prescribed Asymmetric Traction in Three-Dimensional Transverse Isotropy, 10
 Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413
 Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297
 Torsional Stress Concentration in Thin-Walled Beams, 379
- Stress distribution**
 Pre-Tensioned and Posttensioned Composite Girders, 974
 Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456
 Spheroidal Cavity with Prescribed Asymmetric Traction in Three-Dimensional Transverse Isotropy, 10
 Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334
- Stress intensity factor**
 A Crack Initiating from Rhombic Rigid Inclusion, 431
 Frictional Punch and Crack in Plane Elasticity, 333
 Mode I Fracture in Concrete Using Center-Cracked Plate Specimens, 285
- Stress strain relations**
 1D Strain in Normally Consolidated Cohesive Soils, 485
 Post-Buckling Analysis of Steel Space Trusses, 839
 Punching in R.C. Slabs, 890

SUBJECT INDEX

Structural engineering

Theoretical and Experimental Study of Regular Packings of Granules, 306

Stress strain relations, soils

Slip Mechanism-Based Constitutive Model for Granular Soils, 311

Strip mining

Treatment of Manganese from Mining Seep Using Packed Columns, 163

Striped bass

Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166

Structural analysis

Boundary Element Methods in Structural Analysis, 1302

Brick Masonry: U.S. Office Building in Moscow, 43

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Continuum Damage Theory—Application to Concrete, 284

CSTRUCT: Computer Environment for Design of Steel Structures, 115

Dynamic Synthesis of Nonclassically Damped Substructures, 265

Earthquake Load for Structural Reliability, 873

Exact or Lower Bound Tapered Column Buckling Loads, 851

P-Delta Analysis of Building Structures, 830

Potential Errors in Approximate Methods of Structural Analysis, 845

Progressive Collapse: U.S. Office Building in Moscow, 44

Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824

Selected Papers from Chinese Journals of Structural Engineering, 1333

Structural Analysis of Bimodular Materials, 322

Structural Design, Analysis and Testing, 1335

Structure: U.S. Office Building in Moscow, 42

Structures for Enhanced Safety and Physical Security, 1337

Structural behavior

Free Net Analysis Under Squared Error Loss, 1009

Lessons from Explosive Tests on RC Buried Arches, 833

Structures for Enhanced Safety and Physical Security, 1337

Structural control

Control Systems of Building Structures by Active Cables, 959

Experimental Digital Control of Structures, 339

Experimental Study of Active Control for MDOF Seismic Structures, 363

Structural design

Building Moon Bases, 1176

CSTRUCT: Computer Environment for Design of Steel Structures, 115

Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349

Haunches and Hangers, 1199

Knowledge-Based Standard-Independent Member Design, 870

New Set of Buckling Parameters for Monosym-

metric Beam-Columns/Tie-Beams, 876

Nonlinear Mixed-Discrete Structural Optimization, 822

Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367

Optimization of Structural Design Checking, 932

Project Peer Review: Results of the Structural Failures II Conference, 56

Seismic Codes: Preparing for the Unknown, 1285

Structural Design, Analysis and Testing, 1335

Structural Engineer's Concept of Lunar Structures, 21

Structures for Enhanced Safety and Physical Security, 1337

Superskyscraper, 1201

Structural dynamics

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171

Control Systems of Building Structures by Active Cables, 959

Experimental Study of Active Control for MDOF Seismic Structures, 363

In-Plane Vibrations of X-Braced Frames, 410

Modal Identification of Vibrating Structures Using ARMA Model, 402

Modified Dynamic Condensation Method, 800

Recursive Optimization for Seismic Steel Frames, 812

Simplified Evaluation of Added Hydrodynamic Mass for Intake Towers, 348

Structural elements

Combined Stress Behavior of Structural Glazing Joints, 858

Structures for Enhanced Safety and Physical Security, 1337

Structural engineering

Basic Problem on Optimal Spatial Cable Layout, 330

Buckling Strength of Partially Restrained I-Beams, 862

Computer Utilization in Structural Engineering, 1310

Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785

Crack Control in Beams Using Deformed Wire Fabric, 945

Domed Renovations, 1257

Effective Length Factor for Columns in Unbraced Frames, 794

Efficient Algorithm for Stochastic Structural Optimization, 881

Human Error in Structural Design Tasks, 895

Hysteretic Shear Model for Reinforced Concrete Members, 793

PC-Based Data Acquisition System for Structural Monitoring, 123

Restoring an Impaired Concrete Silo, 46

Seismic Analysis of Multistory Building Systems

Using Microcomputers, 101

Selected Papers from Chinese Journals of Structural Engineering, 1333

Simplified Second-Order Elastic-Plastic Analysis of Frames, 104

Structural Control by Temporal Finite Elements, 35

Structural Design, Analysis and Testing, 1335

Structural Engineer's Concept of Lunar Structures, 21

Wind Response Spectrum, 390

Structural failures

Assessment of Seismic Structural Damage, 916

Seismic Failure Rates of Multistory Frames, 802

Shelf Angles for Masonry Veneer, 815

Structures for Enhanced Safety and Physical Security, 1337

Structural materials

Structural Materials, 1336

Structural members

Analytical Solution to Free Vibration of Sector Plates, 429

Behaviors of Steel and Composite Beams at Various Displacement Rates, 910

Brace Fractures and Analysis of Phase I Structure, 904

Computer Graphics in Truss-Model Design Approach, 120

Cracking the Fire Code, 1218

Design Interaction Equations for Steel Members, 885

Dynamic Stability of Thin-Walled Structural Members Under Periodic Axial Torque, 266

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Pseudolinear and Equivalent Systems for Large Deflections of Members, 414

Steel Structures, 1334

Wave-Tubular Member—Wave and Current Interaction, 1170

Structural models

Experimental Study of Active Control for MDOF Seismic Structures, 363

Structural reliability

Earthquake Load for Structural Reliability, 873

Probabilistic Consolidation Analysis with Model Updating, 457

Structural System Reliability Using Linear Programming and Simulation, 931

Structural response

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Dynamic Skin-Friction Effects on Buried Arches, 893

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Mode-Superposition Methods for Elastoplastic Systems, 400

Modified Frequency-Domain Data Processing, 408

Structural Response Variability III, 370

Structural safety

Assessment of Seismic Structural Damage, 916

Experimental Study of Active Control for MDOF Seismic Structures, 363

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Structures for Enhanced Safety and Physical Security, 1337

Structural stability

Asymmetrical Buckling of Prestressed Tapered Arches, 388

Effective Length Spectra for Cross Bracings, 972

Performance of Some Structures Constructed on Chromium Ore Fills, 48

Structural steels

Cyclic Behavior of Double Angle Connections, 852

Rate-Dependent Material Model for Structural Steel, 291

Structure reinforcement

Connections Between Precast Elements—Failure Within Connection Region, 976

Structures

Active Optimal Control of Structure Using Optimal Observer, 421

Effect of Early Freezing on Permeability of Cement Paste, 778

Fold and Bond Construction of Cement Laminated Structural Shapes, 779

Fracture Mechanics Analysis of High-Strength Concrete, 782

Influential Mode of Imperfection on Carrying Capacity of Structures, 397

Model Tests of Gravity Platforms: Description, 533

Seismic Codes: Preparing for the Unknown, 1285

Setting Stresses in Polymer Composites with Multiple-Size Particles, 784

Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Stochastic Finite Element Expansion for Random Media, 326

Structural Control by Temporal Finite Elements, 35

Structural Design, Analysis and Testing, 1335

Struts

Buckling and Postbuckling Analyses of Struts with Discrete Supports, 307

Buckling of Three-Dimensional Rigid—Link Model, 271

Construction Effects on Bracing on Curved I-Girders, 915

Students

Actions Necessary to Make Civil Engineering More Attractive to High-Quality High School Students, 237

Attracting Today's Youth to Civil Engineering, 251

Award for an A-Frame, 1241

Finding and Keeping Technical Experts in the 1990s, 738

Summer Institutes for Minority High School Students, 236

Subassemblies

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

SUBJECT INDEX

Surveying

Subcritical flow

Open Channel Flow Through Transverse Floor Outlets, 678

Subdivisions

General Direct Method for Land Subdivision, 1012
History and Method of Indian Allotment Surveys, 1008

Subgrades

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Submerging

Submergence Factors for Hydraulic Turbines, 442

Subsidence

Building Response to Excavation-Induced Settlement, 446
GPS Determination of Ground Water Withdrawal Subsidence, 993
Monitoring Crustal Deformation in Eastern Maine Using GPS, 988
Sines Revisited, 1145

Substrates

Inhibitory Substrate Utilization by Steady-State Biofilms, 158
Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210

Subsurface drainage

Drainage of Landfill Covers and Bottom Liners: Unsteady Case, 208
Steady Drainage of Landfill Covers and Bottom Liners, 209

Subsurface flow

Analytical Model for Border Irrigation, 729
Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083

Subsurface investigations

Evaluation of Subsurface Exploration Programs, 80
Geologic Prediction Model for Tunneling, 7

Subsystems

Performance and Building: Problems of Evaluation, 58

Subway tunnels

Steady State Vibration of Subway-Soil-Building System, 270

Subways

Rebuilding Philadelphia's El, 1187
Water Beneath the City Streets, 1251

Sulfides

Sulfide in Wastewater Collection and Treatment Systems, 1338

Sulfur dioxide

Kinetics of Reaction of SO₂ with Marble, 773
Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774

Sulfur dioxides

Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692

Sunspots

Hale Cycle and Indian Drought and Flood Area Indexes, 682

Superstructure

New Piers for an Old Bridge, 1190
Orchestral Maneuvers, 1197

Superstructures

Superscraper, 1201

Supervision

Concrete Bridge Design and Construction in the United Kingdom, 100

Supports

Buckling and Postbuckling Analyses of Struts with Discrete Supports, 307
Predicting Deflections of Reinforced Concrete Beams Analytically, 855

Surface defects

Effect of Contaminants and Cure Time on EPDM Single-ply Joint Strength, 780

Surface drainage

Treatment of Manganese from Mining Seep Using Packed Columns, 163

Surface dynamics

Surficial Stability of Compacted Clay Slopes, 478

Surface irrigation

Analytical Model of Level Basin Irrigation, 664

Surface jets

Turbulent Surface Jet in Channel of Limited Depth, 646

Surface runoff

Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112

Surface waters

Irrigated Agriculture and Water Quality in South, 718
Water Resources Management in North China Plain, 1109
Water Rights Modeling and Analysis, 1097
What a Layperson Needs to Know About Water Rights, 691

Surface waves

Diffraction of SV Waves by Circular Canyons of Various Depths, 389

Surge

Measurements of Mixed Transient Flows, 559

Surge Tanks

Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440

Surveying

Analytical Solution of Magnetic Declination Problem, 1004
Application of Graph Theory to Computer-Assisted Mapping, 1010
Development of a GPS Active Control Point Station, 981
Engineering Applications of GPS Differential Surveying, 1006
Establishment of the Kansas City GPS Control Network, 997
Fundamentals of GPS Baseline and Height Determinations, 996
GPS Antenna Set-Up Procedures and Error

- Sources, 1002
- GPS Satellite Surveys and Vertical Control, 1000
- GPS-Guided Vision Systems for Real-Time Surveying, 998
- History and Method of Indian Allotment Surveys, 1008
- Strategic Planning Tool for GPS Surveys, 994
- Surveying With Motorola Eagle GPS Receiver, 999
- Surveys**
- Free Net Analysis Under Squared Error Loss, 1009
- Selection of GPS Receiver for Survey Applications, 986
- Strategic Planning Tool for GPS Surveys, 994
- Surveys, data collection**
- ASCE 1987 Salary Survey, 239
- Equipment Policy of Top 400 Contractors: A Survey, 79
- Method to Deal with DBE Issues, 248
- Property-Value Guarantees for Waste Facilities, 1068
- Status of Government Civil Engineers in America, 252
- Suspended sediments**
- Comparison: US P-61 and Delft Sediment Samplers, 654
- Density Measurement of Particle and Floc Suspensions, 574
- Modeling Mixed Sediment Suspended Load Profiles, 594
- Suspended solids**
- Impact of Land Use and NPS Loads on Lake Quality, 179
- Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577
- Suspended structures**
- Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59
- Swelling**
- Collapse of Compacted Clayey Sand, 515
- Swelling pressure**
- Laboratory Evaluation of Lateral Swelling Pressure, 529
- Symmetry**
- New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876
- Synthesis**
- Mapping and Synthesis of Random Pressure Fields, 407
- Syria**
- Potential of Irrigated Agriculture in Syria, 1093
- System analysis**
- Does Civil Engineering Need System Engineering?, 227
- Floodplain-Management Plan Enumeration, 1101
- Intelligent Decision Support and Reservoir Management and Operations, 125
- Systems Analysis of Tank Irrigation: I. Crop Staggering, 687
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688

- System reliability**
- Efficient Algorithm for Stochastic Structural Optimization, 881
- Systems**
- Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250
- Economical Analysis of Combined Dynamical Systems, 395
- Eigenproperties of Classically Damped MDOF Composite Systems, 356
- Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
- Reciprocal Conjugate Method for Space Curved Bars, 818
- System Reliability Under Time Varying Loads: I, 312
- System Reliability Under Time Varying Loads: II, 313
- Systems engineering**
- Curriculum for Future Civil Engineers: Practitioner's Viewpoint, 250
- Does Civil Engineering Need System Engineering?, 227
- Tailings**
- Cap Stabilization for Reclaimed Uranium Sites, 443
- Reclamation of Exxon Ray Point Tailings Basin, 444
- Tall buildings**
- Aerodynamic Model Tests of Tall Buildings, 300
- Analysis of Multitriangular-Braced Structures, 896
- Orchestral Maneuvers, 1197
- Seismic Analysis of Multistory Building Systems Using Microcomputers, 101
- Superskyscraper, 1201
- Tanks**
- Ashland Tank Collapse Investigation, 51
- Brittle Fracture and Collapse of Large Grain-Storage Tank, 52
- Distortion of Steel Tanks Due to Settlement of Their Walls, 495
- Effect of Envelopes on Flow Pattern Near Drain Pipe, 704
- Optimization Model for Water Distribution System Design, 632
- Systems Analysis of Tank Irrigation: I. Crop Staggering, 687
- Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
- Taper**
- Exact or Lower Bound Tapered Column Buckling Loads, 851
- Tapered Box Columns Under Biaxial Loading, 888
- Teamwork**
- Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072
- Technology**
- Bullwinkle, 1234
- Future Irrigation Prospects and Actions in Developing World, 706
- Improving Management of Technology, 760
- Managing for Increased Design and Construction

- Innovation, 766
- Organizing to Increase Innovation in the Construction Firm, 99
- Strategic Defense Initiative Six Years Later in the Army, 30
- Technology and Strategic Management in Construction, 740
- Toward Understanding of Product Innovation Process in Construction, 93
- Technology assessment**
- Capital Cost and Operations of High-Speed Rail System in West Germany, 1019
- Cold Regions Engineering Research—Strategic Plan, 139
- Technology and the Constitution, 238
- Temperature**
- Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157
- Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
- Creep Buckling of Cylindrical Shell Under Variable Loading, 327
- Daily Average Value of Un-ionized Ammonia from Field Measurements, 219
- Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162
- Extreme Thermal Loadings in Highway Bridges, 887
- Heat-Straightening Prototype Damaged Bridge Girders, 884
- Marine Curing of Steel Fiber Composites, 775
- Model of Finite Strain Creep of Metals, 353
- Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211
- Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212
- Strength Characteristics of Frozen Fox Gravel, 132
- Surface Thermal Plume in Channel, 600
- Temperature effects**
- Accuracy of Estimated Reference Crop Evapotranspiration, 730
- Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
- Cracking the Fire Code, 1218
- Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969
- Geothermal Energy Applications in Wastewater Treatment, 129
- The History of Frost Research in Minnesota, 134
- Nonisothermal Consolidation in Unsaturated Soil, 522
- Temporary structures**
- Evaluation of New Concepts for Cellular Structure Construction, 61
- Wind Design Problems with Building Structures During Construction, 29
- Tendons**
- Control Systems of Building Structures by Active Cables, 959
- Finite Element Model for Curved Embedded Reinforcement, 308
- Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135
- Post-Tensioned Transportation, 1272
- Unbonded Performance, 1275
- Tensile load**
- Model of Finite Strain Creep of Metals, 353
- Tensile strength**
- FEM Dynamic Fracture Analysis of Concrete Beams, 396
- Size Effects on Strength, Toughness and Ductility, 347
- Tension**
- Analytical Study of Prestressed Composite Beams, 927
- Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Free Tension Concept for Precise Taping, 1014
- Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Soil Resistances to Embedded Anchor Chain in Soft Clay, 526
- Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432
- Uniaxial Behavior of Concrete in Cyclic Tension, 795
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843
- Welded-Tee End Connections for Circular Hollow Tubes, 975
- Tension leg platforms**
- Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481
- Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135
- Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920
- Tension Leg Platform: a State of the Art Review, 1339
- Tension structures**
- Fabric Meets Cable, 1188
- Terminal facilities**
- Ports '89, 1325
- Terminology**
- List of Sea-State Parameters, 1172
- Tertiary treatment**
- Particle Filtration for Wastewater Irrigation, 693
- Testing**
- Connections Between Precast Elements—Failure Within Connection Region, 976
- Failure of Concrete Pavements in Test Tracks, 1048
- A Hazardous Data Explosion, 1296
- Influence of Cementation on Liquefaction of Sands, 507
- Practical Quality-Controlled Construction, 54
- Resilient Moduli of Soils: Laboratory Conditions, 1329
- Storage of Heated Water in Underground Openings, 480
- Structural Design, Analysis and Testing, 1335
- Ultimate Strength of Wood Walls in Tension—Pilot Study, 894
- Web-Crippling Strength of Cold-Formed Steel

Testing

Beams, 936

Welded-Tee End Connections for Circular Hollow Tubes, 975

Tests

Compression Tests of Welded Channel Section Columns, 832

Failure of Concrete Pavements in Test Tracks, 1048

Fatigue Behavior of Composite Metal Deck Slabs, 790

Interior Joints with Variable Anchorage Lengths, 921

Low-Stress Dilation Test, 489

Modal Identification of Vibrating Structures Using ARMA Model, 402

Model Tests of Gravity Platforms: Description, 533

Sinusoidal Forced Vibration of Sliding Masonry System, 891

Strength and Deformability of Steel Column Footing, 911

Test Embankment Dam of Fracture Grouting, 541

Tests of Jet Pump Operating under Head of 300 M, 441

Texas

Channel Tunnel, Texas Style, 1286

Domed Renovations, 1257

Theories

Engineering Large Deflection Theory for Thick Plates, 320

Thermal factors

Concrete Degradation Due to Thermal Incompatibility of Its Components, 777

Geometry of Arrested Thermal Wedges, 1174

Thermal power plants

Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095

Thermal properties

Factors Influencing Thermal Resistivity of Sands, 543

The History of Frost Research in Minnesota, 134

Thermal Instability in Buried Cable Backfills, 448

Thermal resistance

Factors Influencing Thermal Resistivity of Sands, 543

Thermal Instability in Buried Cable Backfills, 448

Thermal stratification

Geometry of Arrested Thermal Wedges, 1174

Modeling Thermal Stratification in Transparent Adirondack Lake, 1099

Thermodynamics

Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774

Thermography

Detecting the Defects, 1263

From Guesswork to Guarantee?, 1264

Thickness

AASHTO Flexible Pavement Design Equation Study, 1052

Equivalent Systems for Variable Thickness Plates, 405

1989 ASCE TRANSACTIONS

Thin shell structures

Repair and Completion of Damaged Cooling Tower, 819

Thin wall sections

Yield Surfaces for I-Sections with Biomoments, 968

Thin wall structures

Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970

Equations of Curved Beams, 329

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Thin-Walled Steel Box Columns Under Biaxial Loading, 948

Torsional Stress Concentration in Thin-Walled Beams, 379

Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Three-dimensional analysis

Constitutive Equations for Concrete in Failure State, 362

Elasticity of Particulate Materials, 490

Seismic Analysis of Multistory Building Systems Using Microcomputers, 101

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Three-dimensional flow

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394

Three-dimensional models

Analyzing in 3D, 1196

Finite Element Modeling of Left Ventricle, 375

Tidal energy

Compendium of International Ocean Energy Activities, 1309

Tidal hydraulics

Analytic Solutions for Tidal Model Testing, 655

Tidal power generations

Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

Tidal waters

Building A Better Wetland, 1245

Cohesive Sediment Transport Part I: Process Description, 614

Cohesive Sediment Transport Part II: Application, 615

Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577

Water Quality Model for Small Tidal Inlet Systems, 152

Tides

Interaction of Tide and River Flow, 1130

Tieback restraint systems

Tieback Supported Cuts in Overconsolidated Soils, 475

Use of STABL Program in Tied-back Wall Design, 476

Tied concrete columns

Analytical Study for Concrete Confinement in Tied Columns, 954

Ties

- Effect of Support Movement on Hyperbolic Paraboloid Shells, 786
- Impact Load Distribution in Concrete Bridge Ties, 816
- Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520

Timber construction

- Cyclic Load Behavior of Bolted Timber Joint, 935
- Reliability-Based Design of Wood Structural Systems, 886
- Roof Collapse, Taxi Cab Company Garage, Campaign, Illinois, 49
- Ultimate Strength of Wood Walls in Tension—Pilot Study, 894
- Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Timbers

- Application of Orthotropic Failure Criterion to Wood, 316
- Roof Collapse, Taxi Cab Company Garage, Campaign, Illinois, 49

Time dependence

- Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938
- Daily Average Value of Un-ionized Ammonia from Field Measurements, 219
- Influence Coefficients for Dynamic Response of Foundations, 417
- Structural Control by Temporal Finite Elements, 35
- Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032

Time factors

- Time-Cost Trade-off Among Related Activities, 90

Time series analysis

- Estimating Terminal Lake Level Frequencies, 1091
- Rainfall Intervention Analysis for On-Line Applications, 1096
- Time Series Analysis of Water Quality Data in Pearl River, China, 176

Timing

- Strategic Planning Tool for GPS Surveys, 994

Toll roads

- Meeting the Challenge: Working Together on Transportation Infrastructure, 762

Topography

- Internal Lee Waves in Turbulent Two-Layer Flow, 629

Torsion

- Aerodynamic Model Tests of Tall Buildings, 300
- Approximate Analysis of Twisted Parallelepiped, 275
- Boundary Element Methods in Structural Analysis, 1302
- Buckling of Three-Dimensional Rigid—Link Model, 271
- Construction Effects on Bracing on Curved I-Girders, 915
- Earthquake Response of Torsionally Coupled, Frame Buildings, 835
- Lateral-Torsional Coupling in Earthquake Re-

sponse of Frame Buildings, 836

- Prestressed Concrete Beams with Opening Under Torsion and Bending, 949
- Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
- Shakedown of Grids Under Combined Bending and Torsion, 961
- Stability of Pretwisted Bars with Various End Torques, 304
- Strain Increment and Stress Directions in Torsion Shear Tests, 524
- Stress Distribution and Deformation of Adhesive-Bonded Laminated Composite Beams, 334
- Torsional Response of Symmetric Structures, 277
- Torsional Stress Concentration in Thin-Walled Beams, 379
- Yield Surfaces for I-Sections with Bimoments, 968

Torsional coupling

- Earthquake Response of Torsionally Coupled, Frame Buildings, 835
- Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836

Tort laws

- Negotiating and Drafting the Civil Engineering Contract, 756

Toughness

- Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781

Towers

- Bells Under Bells, 1295
- Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349
- Expressway Centerpiece, 1194
- Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Frequency Response Functions, 868
- Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Earthquake Responses, 869
- Simplified Evaluation of Added Hydrodynamic Mass for Intake Towers, 348

Toxic wastes

- Environmental Engineering Infrastructure: Problems and Needs, 225
- Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

Toxicity

- Daily Average Value of Un-ionized Ammonia from Field Measurements, 219
- Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160
- Mitigation of Biological Process Upsets Caused by Organic Inhibitors, 204
- Models of Sorptive Toxic Substances in Freshwater Systems. I: Basic Equations, 13
- Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14
- Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15
- Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
- Selenium in Arid and Semi-arid Soils, 661

Tracking

Tracking

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Tractive force

Width of Straight Alluvial Channels, 568

Traffic

Failure of Concrete Pavements in Test Tracks, 1048

HIBIC: Expert System for Highway Bridge Dynamics, 124

Traffic accident analysis

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Traffic accidents

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Goods Transportation in Urban Areas, 1319

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Traffic accidents analysis

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Traffic analysis

Accuracy of Turning Flow Estimates at Road Junctions, 1044

Ohio River Bank Erosion—Traffic Effects, 1150

Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Traffic capacity

Effect of Platoons on Permissive Left-Turn Capacity: Pilot Study, 1029

Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036

Traffic conflicts

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Traffic congestion

Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

Traffic control

Freeway Surveillance and Control System Using Simulation Model, 1043

General Aviation Collision-Avoidance Alternatives, 1047

The Race for Smart Cars, 1279

Traffic control devices

Commuter Control, 1185

Freeway Surveillance and Control System Using Simulation Model, 1043

General Aviation Collision-Avoidance Alternatives, 1047

The Race for Smart Cars, 1279

Use of Binary Choice Decision Process for Adaptive Signal Control, 1033

Traffic flow

Accuracy of Turning Flow Estimates at Road Junctions, 1044

Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

1989 ASCE TRANSACTIONS

Effect of Platoons on Permissive Left-Turn Capacity: Pilot Study, 1029

Freeway Surveillance and Control System Using Simulation Model, 1043

HIBIC: Expert System for Highway Bridge Dynamics, 124

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Traffic flow pattern

Traffic Platoon Dispersion Modeling, 1028

Traffic management

Application of VADAS to Complex Traffic Environments, 1050

Commuter Control, 1185

The Race for Smart Cars, 1279

Traffic planning

Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

Traffic safety

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Traffic signal controllers

Traffic Platoon Dispersion Modeling, 1028

Use of Binary Choice Decision Process for Adaptive Signal Control, 1033

Traffic signals

Traffic Platoon Dispersion Modeling, 1028

Traffic speed

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Traffic surveillance

Freeway Surveillance and Control System Using Simulation Model, 1043

Traffic volume

HIBIC: Expert System for Highway Bridge Dynamics, 124

Prediction of Design Hourly Volume from Road Users' Perspective, 1057

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Training

Training Expatriate Engineering Professionals, 755

Training the Waste Watchers, 1254

Transfer functions

Analysis of Natural Waves by Local Approximations, 1148

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

Transformations

Biotransformation of Aromatics in Strip-Pit Pond, 185

Important Parameters Used in Geodetic Transformations, 1013

Transient response

Role of Damping in Anomalous Response to Short Pulse Loading, 434

SUBJECT INDEX

Transients

Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618

Transmission lines

Steel Structures, 1334

Transport rate

Agriculture and Groundwater Quality, 1242

Comparison: US P-61 and Delft Sediment Samplers, 654

Modeling Solute Transport by Centrifugation, 171

Transportation

Critical Issues in Safe Transport of Hazardous Materials, 1055

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

Transportation engineering

Entropy Model for Consistent Impact-Fee Assessment, 1063

GIS: Technology for Transportation, 1233

Top Projects for 1989, 1240

Transportation models

Avoiding Transportation Future Shock, 1189

Transportation planning

Avoiding Transportation Future Shock, 1189

Goods Transportation in Urban Areas, 1319

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Synthetic Models for Through Trips in Small Urban Areas, 1051

Transportation safety

Critical Issues in Safe Transport of Hazardous Materials, 1055

Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Transportation system costs

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Transportation system financing

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

Transportation systems

Entropy Model for Consistent Impact-Fee Assessment, 1063

Meeting the Challenge: Working Together on Transportation Infrastructure, 762

Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38

Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045

Scheduling Method for Demand-Responsive Transportation System, 1056

Transverse shear

Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422

Transverse strength

Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297

Trapezoidal channels

Trip distribution models

Flow Measurement with Trapezoidal Free Overfall, 667

Trashracks

Force Oscillator Model for Rectangular Cylinder, 344

Travel costs

Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Travel demand

Scheduling Method for Demand-Responsive Transportation System, 1056

Travel modes

Synthetic Models for Through Trips in Small Urban Areas, 1051

Travel patterns

Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054

Scheduling Method for Demand-Responsive Transportation System, 1056

Simulating Activity Chains: German Approach, 1037

Synthetic Models for Through Trips in Small Urban Areas, 1051

Travel time

Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Trenches

Response of Marine Pipelines in Scour Trenches, 1155

Trends

Future Irrigation Prospects and Actions in Developing World, 706

Time Series Analysis of Water Quality Data in Pearl River, China, 176

Triaxial compression

Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336

Triaxial tests

Cementation Effects in Frictional Materials, 523

Dynamic Triaxial Tests of High-Strength Concrete, 317

Stress-Path-Dependent Correction for Membrane Penetration, 549

Trickle irrigation

Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715

Hydraulics of Catenary Irrigation Trail Tubes, 669

Particle Filtration for Wastewater Irrigation, 693

Trilateration

GPS Processing Methods: Comparison with Precise Trilateration, 992

Trip distribution models

Scheduling Method for Demand-Responsive Transportation System, 1056

Synthetic Models for Through Trips in Small Urban Areas, 1051

Trip forecasting

Synthetic Models for Through Trips in Small Urban Areas, 1051

Trucks

Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035

Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038

Goods Transportation in Urban Areas, 1319

Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039

Issues and Problems of Moving Goods in Urban Areas, 1015

Truck Capacity Selection for Earthmoving, 72

Trusses

Computer Graphics in Truss-Model Design Approach, 120

The Effect of Compatibility and Prestressing on Optimized Trusses, 828

Emulation for Control System Analysis in Automated Construction, 122

Influential Mode of Imperfection on Carrying Capacity of Structures, 397

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

Material Behavior and Optimum Design of Structural Systems, 849

New Formulation for Vibration Analysis, 296

New Roof for an Aging Temporary, 1276

Plastic Reliability Analysis by Directional Simulation, 345

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

Superskyscraper, 1201

Tubes

Effect of External Pressure on Strength of Short Tubular Members, 9

Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465

Hydraulics of Catenary Irrigation Trail Tubes, 669

Limit Analysis of Bolted RHS Flange Plate Joints, 919

Mechanical Model for Oscillating Water Column with Compressibility, 377

Welded-Tee End Connections for Circular Hollow Tubes, 975

Tunnel construction

Automating Design of Boston's Artery, 1229

Channel Tunnel, Texas Style, 1286

An Education in Tunneling, 1202

An Education in Tunneling, 1208

Managing a Megaproject, 1225

Tunnel Talk, 1288

Tunnel linings

Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435

Channel Tunnel, Texas Style, 1286

An Education in Tunneling, 1202

An Education in Tunneling, 1208

Segmental Tunnel Lining Meets 'Buy American', 1269

Tunneling

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Building Response to Excavation-Induced Settlement, 446

Channel Tunnel, Texas Style, 1286

An Education in Tunneling, 1202

An Education in Tunneling, 1208

Field Performance of Structural Slurry Wall, 454

Geologic Prediction Model for Tunneling, 7

Tunnel Talk, 1288

Tunnels

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435

Building Response to Excavation-Induced Settlement, 446

Centrifuge Study of Faulting Effects on Tunnel, 499

Turbidity

Density Measurement of Particle and Floc Suspensions, 574

Direct Filtration of *Chlorella* with Cationic Polymer, 161

Turbines

Cavitation Erosion in Hydroturbines, 626

Electricity From Air, 1239

Submergence Factors for Hydraulic Turbines, 442

Turbulence

Deterministic Model for Wind-Induced Oscillations of Buildings, 272

Entrainment by Buoyant Jet Between Confined Walls, 578

Experimental Investigation of Shallow Recirculating Flows, 602

Hydraulic Jump as "Mixing Layer", 647

Internal Lee Waves in Turbulent Two-Layer Flow, 629

Stochastic Stability of Bridges Considering Coupled Modes: II, 286

Surface Thermal Plume in Channel, 600

Turbulence Characteristics of Sediment-Laden Flow, 595

Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577

Turbulent diffusion

Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394

Turbulent Surface Jet in Channel of Limited Depth, 646

Turbulent flow

Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Two phase flow

Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639

Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640

Two-dimensional

Error Estimation for Boundary Element Analysis, 386

Two-dimensional models

Antiplane Earthquake Waves in Long Structures, 428

Calculation of Bed Variation in Alluvial Channels, 572

River-Meander Model: I. Development, 635

River-Meander Model: II. Applications, 636

Seismic Waves in Buildings with Shear Walls Or Central Core, 427

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Ultimate loads

Material Behavior and Optimum Design of Structural Systems, 849

Welded-Tee End Connections for Circular Hollow Tubes, 975

Ultimate strength

Tapered Box Columns Under Biaxial Loading, 888

Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943

Ultrasonic testing

Measurement and Description of Tensile Fracture in Granite, 382

Uncertainty

Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525

Uncertainty analysis

Expected Annual Damages and Uncertainties in Flood Frequency Estimation, 1078

Knowledge-Based System for Soil Improvement, 118

Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112

Restructuring Organizations: Alternatives and Costs, 746

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

System Reliability Under Time Varying Loads: II, 313

Water Distribution System Design Under Uncertainties, 1111

Undergraduate study

Cold Regions Environmental Engineering: Tomorrow's Challenges, 135

Quality Undergraduate Engineering Education—A Critical Perspective, 241

Solving Low Enrollment Problems in Civil Engineering, 242

Underground construction

Avoiding and Resolving Disputes in Underground Construction, 1300

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Underground storage

Storage of Heated Water in Underground Openings, 480

Underground structures

Dynamic Skin-Friction Effects on Buried Arches, 893

Field Performance of Structural Slurry Wall, 454
Water Beneath the City Streets, 1251

Underwater structures

Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166

Undrained shear tests

Behavior of Foundation Clays Supporting Compliant Offshore Structures, 481

Cyclic Behavior of Clays in Undrained Simple Shear, 482

Uniform flow

Several Sources of Nonuniformity in Irrigation Delivery Flows, 725

Uniformity

Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708

Unit hydrographs

Rainfall-Runoff Transfer Function by ARMA Modeling, 631

United Kingdom

Concrete Bridge Design and Construction in the United Kingdom, 100

Use of Geotextiles and Geocomposites in the United Kingdom, 75

United States

Comparison of U.S. and Japanese Practices in Public Construction, 92

The Race for Smart Cars, 1279

Seismic Codes: Preparing for the Unknown, 1285

They're Coming to America, 1280

Universities

Continuing Education for Engineers: University's Role, 255

Unpaved roads

Analysis of Climate Effects on Performance of Unpaved Roads, 1041

Unsaturated flow

On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716

Unsteady flow

Dam-Break Flows in Curved Channel, 637

Dilution Discharge Measurement during Flood Wave, 645

Mass Conservation: 1-D Open-Channel Flow Equations, 565

Modeling of Unsteady Flow in Curved Channel, 638

Stable Predictive Control of Open-Channel Flow, 710

Viscous Damping: Time Convolution of the Impulsive Solution, 652

Uplift

Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436

Estimation of Uplift Pressures in Cracks in Older Concrete Gravity Dams 2: Effect of Head Losses in Drain Pipes on Uplift, 437

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Ultimate Strength of Wood Walls in Tension—Pilot

- Study, 94
- Uplift pressure**
- Interaction of Finite Amplitude Waves with Platforms or Docks, 1126
- Uranium**
- Cap Stabilization for Reclaimed Uranium Sites, 443
- Reclamation of Exxon Ray Point Tailings Basin, 444
- Urban areas**
- Goods Transportation in Urban Areas, 1319
- Hydrodynamic Analysis of Floods in Urban System, 1105
- National Water Conference, 1324
- People Movers Move Downtown, 1192
- Sensitivity Study of Detention Basins in Urbanized Watershed, 1069
- Synthetic Models for Through Trips in Small Urban Areas, 1051
- Urban Groundwater Rise Control: Case Study, 702
- Water Beneath the City Streets, 1251
- Urban development**
- Bridge Design and the "Bridge Aesthetics Bibliography", 838
- Global Changes and New Challenges for Civil Engineers, 226
- Land Use and Urban Planning in Paradise: Waikiki, 1060
- Urban planning**
- Exurban Living Using Improved Water and Wastewater Technology, 1066
- Issues and Problems of Moving Goods in Urban Areas, 1015
- Land Use and Urban Planning in Paradise: Waikiki, 1060
- Problems of Housing in Kuwait, 1067
- Water and Urban Land-Use Planning in Cali, Colombia, 1119
- Urban runoff**
- Design of Urban Runoff Quality Controls, 1314
- Detention Pond Sizing for Multiple Return Periods, 589
- National Water Conference, 1324
- Sensitivity Study of Detention Basins in Urbanized Watershed, 1069
- Toward a New Rational Method, 622
- Urban transportation**
- Financing Urban Transportation, 1186
- Global Changes and New Challenges for Civil Engineers, 226
- Issues and Problems of Moving Goods in Urban Areas, 1015
- Meeting the Challenge: Working Together on Transportation Infrastructure, 762
- People Movers Move Downtown, 1192
- Simulating Activity Chains: German Approach, 1037
- Synthetic Models for Through Trips in Small Urban Areas, 1051
- U.S. Army Corps of Engineers**
- Continuous Deformation Monitoring with GPS, 985

- Failure of Concrete Pavements in Test Tracks, 1048
- Safer Dams, 1259
- U.S.S.R.**
- Assessment: U.S. Office Building in Moscow, 41
- Brick Masonry: U.S. Office Building in Moscow, 43
- Progressive Collapse: U.S. Office Building in Moscow, 44
- Structure: U.S. Office Building in Moscow, 42
- Utilities**
- Minimization of Raw Water Pumping Costs Using MILP, 1104
- Regionalization in Water Supply Industry: Status and Needs, 1094
- Utilization**
- Computer-Integration: Reducing Fragmentation in AEC Industry, 102
- Verifying Software by Use, 1223
- Vadose zone**
- Agriculture and Groundwater Quality, 1242
- Value engineering**
- What is an "Ethical" Engineer?, 763
- Valves**
- Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618
- Optimization Model for Water Distribution System Design, 632
- Variability**
- Bounds on Response Variability of Stochastic Systems, 420
- Density Tests Above Zero Air Voids Line, 502
- Equivalent Systems for Variable Thickness Plates, 405
- Experiment Design Approach to Nondestructive Testing of Pavements, 1049
- Stochastic Finite Element Expansion for Random Media, 326
- Structural Response Variability III, 370
- Vegetation**
- Management Model for Control of On-Farm Irrigation, 727
- Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343
- Velocity**
- Bottom Boundary Layer Under Nonlinear Wave Motion, 1127
- Effect of Sediment Density on Bed Load Transport, 556
- Equations Describing Sprinkler Droplet Velocity, 670
- Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656
- Interaction of Tide and River Flow, 1130
- Mechanics of Overflow Erosion on Embankments: Part I- Research Activities, 612
- Mechanics of Overflow Erosion on Embankments: Part II. Hydraulic and Design Considerations, 613
- Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394
- Strategic Defense Initiative Six Years Later in the Army, 30

Velocity distribution

Laser Measurements and Computations of Viscous Flows Through Cylinders, 621

Simple Mean Free Path Theory for Stresses in a Rapid Granular Flow, 340

Velocity Distribution in Open Channel Flow, 585

Velocity Redistribution in Meandering Rivers, 611

Velocity profile

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Veneers

Shelf Angles for Masonry Veneer, 815

Verification inspection

Verifying Software by Use, 1223

Vertical cylinders

Free-Surface Flow Produced by Accelerating Vertical Cylinder, 359

Vertical loads

Potential Errors in Approximate Methods of Structural Analysis, 845

Viaducts

Automating Design of Boston's Artery, 1229

CAD Speeds Viaduct Replacement, 1252

Vibration

Active Optimal Control of Structure Using Optimal Observer, 421

Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412

Analytical Model for Longitudinal Soil Vibration, 463

Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

Characteristics of Response to Nonstationary White Noise: Theory, 380

Characteristics of Response to Nonstationary White Noise: Applications, 381

Coupled Vibration of Embedded Foundation, 513

Deer Isle Bridge: Efficacy of Stiffening Systems, 923

Deer Isle Bridge: Field and Computed Vibrations, 924

Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378

Dynamic Stability of Thin-Walled Structural Members Under Periodic Axial Torque, 266

Flow-Induced Vibrations of Rectangular Cylinders, 627

Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134

Impedance Functions and Input Motions for Embedded Square Foundations, 473

In-Plane Vibrations of X-Braced Frames, 410

Lower Bounds for Eigenvalues via Rayleigh's Method, 346

Modal Identification of Vibrating Structures Using ARMA Model, 402

Paradox Unresolved, 318

A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338

Seismic Response of Strip Footings on Zoned

Viscoelastic Soils, 319

Signal Separation Method for Tower Mode Shape Measurement, 827

Stress, Vibration and Buckling of Multilayered Cylinders, 789

Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432

Vertical Vibration of Machine Foundations, 449

Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Viscous Damping: Time Convolution of the Impulsive Solution, 652

Volume Change Behavior of Vibrated Sand Columns, 462

Wind Induced Vibration of Two Flexible Cylindrical Structures, 392

Vibration analysis

Analytical Solution to Free Vibration of Sector Plates, 429

Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282

New Formulation for Vibration Analysis, 296

Response of Marine Pipelines in Scour Trenches, 1155

Signal Separation Method for Tower Mode Shape Measurement, 827

Vibration control

Active Control of Flexural Vibrations in Beams, 33

Vibration damping

Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134

Vibration effects

Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278

Vibration measurement

Deer Isle Bridge: Efficacy of Stiffening Systems, 923

Deer Isle Bridge: Field and Computed Vibrations, 924

Vibration response

Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12

Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11

Vibrations

Antiplane Earthquake Waves in Long Structures, 428

Axisymmetric Vibrations of Reinforced Orthotropic Shallow Spherical Caps, 34

Vibratory pile driving

Soil-Sheet Pile Interaction in Vibro-Piling, 506

Videotape

Application of VADAS to Complex Traffic Environments, 1050

Dam-Break Flows in Curved Channel, 637

Viscoelasticity

Solidification Theory for Concrete Creep—I. Formulation, 368

Solidification Theory for Concrete Creep II. Veri-

- fication and Application, 369
- Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331
- Viscoelastic Approach to Modeling Performance of Buried Pipes, 1032
- Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803
- Viscoplasticity**
 - Creep Buckling of Cylindrical Shell Under Variable Loading, 327
 - Method for Solving Inverse Elastoviscoplastic Problems, 401
- Viscous flow**
 - Laser Measurements and Computations of Viscous Flows Through Cylinders, 621
- Visual aids**
 - GPS-Guided Vision Systems for Real-Time Surveying, 998
- Void ratio**
 - Consolidation of Sensitive Clay as Phase Change Process, 527
 - Random Nature of Soil Porosity and Related Properties, 332
- Volatile organic chemicals**
 - Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187
 - PCE Volatilized from Stagnant Water and Soil, 215
 - Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174
- Volatilization**
 - Biotransformation of Aromatics in Strip-Pit Pond, 185
 - Effect of Wastewater Application Device on Ammonia Volatilization, 218
 - PCE Volatilized from Stagnant Water and Soil, 215
- Volcanic ash**
 - Storing Sediment and Freeing Fish, 1258
- Volcanoes**
 - Storing Sediment and Freeing Fish, 1258
- Volume change**
 - Alternate Analysis of Pressuremeter Test, 548
 - Estimating Terminal Lake Level Frequencies, 1091
- Volume measure**
 - Estimating Pit Excavation Volume Using Unequal Intervals, 1011
 - Infiltration Function from Furrow Stream Advance, 712
 - Three-Point Method for Estimating Cut and Fill Volumes of Land Grading, 695
- Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650**
- Volumetric strain**
 - Low-Stress Dilation Test, 489
 - Performance of Some Structures Constructed on Chromium Ore Fills, 48
- Volunteers**
 - Award for an A-Frame, 1241
- Vortex shedding**
 - Flow-Induced Vibrations of Rectangular Cylinders, 627

- Force Oscillator Model for Rectangular Cylinder, 344
- Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134
- Response of Marine Pipelines in Scour Trenches, 1155
- Vortices**
 - Sediment Entrainment in Channel with Rippled Bed, 569
 - Wind Induced Vibration of Two Flexible Cylindrical Structures, 392
- Wall friction**
 - Entrainment by Buoyant Jet Between Confined Walls, 578
- Walls**
 - Brick Masonry: U.S. Office Building in Moscow, 43
 - Formwork Pressures in Tall and Thick Concrete Walls, 88
 - Geostatic Wall Pressures, 519
 - Internally Braced Cuts in Overconsolidated Soils, 474
 - Moisture Accumulation in Insulated Walls in Cold Regions, 130
 - Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367
 - Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470
 - Tieback Supported Cuts in Overconsolidated Soils, 475
 - Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
 - Ultimate Strength of Wood Walls in Tension—Pilot Study, 894
- Warpage**
 - Equations of Curved Beams, 329
 - Torsional Stress Concentration in Thin-Walled Beams, 379
- Washington**
 - Avoiding Transportation Future Shock, 1189
 - Storing Sediment and Freeing Fish, 1258
- Washington, DC**
 - Segmental Tunnel Lining Meets 'Buy American', 1269
 - Water Supply Yield Analysis for the Washington Metropolitan Area, 1086
- Waste disposal**
 - Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540
 - Coal Gas Legacy, 1213
 - Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172
 - Properties of Solid Waste Incinerator Fly Ash, 508
 - Putting Waste to Use, 1250
 - Waste Facility Impacts on Residential Property Values, 1064
- Waste management**
 - The Battle Over Burning, 1238
 - Expert System for Evaluating and Notifying Hazardous Waste Generators, 108
- Waste processing facilities**
 - Automated Design of Wastewater Plants, 1228

SUBJECT INDEX

Water content

Environmental Engineering, 1316
Odors: The Other Effluent, 1244
Project Peer Review for Deer Island Secondary Treatment Planning, 247
Property-Value Guarantees for Waste Facilities, 1068
Waste Facility Impacts on Residential Property Values, 1064
Waste recycling
The Battle Over Burning, 1238
Waste site
Considerations for Capping Subaqueous Dredged Material Deposits, 1169
Waste site cleanup
Coal Gas Legacy, 1213
Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172
Fast Tracking Military Waste, 1203
A Hazardous Data Explosion, 1296
The Model Cleanup, 1219
The Saga of Senate Bill 2067, 1207
Suburban Superfund, 1206
Training the Waste Watchers, 1254
What's Wrong With Superfund, 1204
Waste sites
The Challenge of Yucca Mountain, 1205
Environmental Engineering, 1316
Waste sludge production
Sludge Digestion by Anaerobic Fluidized Beds:
I—Lab Performance Data, 211
Sludge Digestion by Anaerobic Fluidized Beds:
II—Kinetic Model, 212
Waste stabilization ponds
Effect of Pond Depth on Bacterial Mortality Rate, 198
Waste treatment
Sludge Digestion by Anaerobic Fluidized Beds:
I—Lab Performance Data, 211
Sludge Digestion by Anaerobic Fluidized Beds:
II—Kinetic Model, 212
Waste utilization
Putting Waste to Use, 1250
Wastewater
Effect of Wastewater Application Device on Ammonia Volatilization, 218
Urban Groundwater Rise Control: Case Study, 702
Wastewater disposal
Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184
Note on Ayoub's Data of Horizontal Round Buoyant Jet in Current, 606
Wastewater management
Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182
Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183
Environmental Engineering Infrastructure: Problems and Needs, 225

Exurban Living Using Improved Water and Wastewater Technology, 1066
Sulfide in Wastewater Collection and Treatment Systems, 1338
Wastewater treatment
Accelerating Electrons, 1211
Automated Design of Wastewater Plants, 1228
Big Trouble in Little America, 1249
Bioactive Adsorber Model for Industrial Wastewater Treatment, 217
Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154
Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162
Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184
Exurban Living Using Improved Water and Wastewater Technology, 1066
Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194
Geothermal Energy Applications in Wastewater Treatment, 129
High Hopes for Cattails, 1215
Improvements in Soil Absorption Trench Design, 193
Modeling Fate and Transport of Nutrients in the James Estuary, 199
Odors: The Other Effluent, 1244
Project Peer Review for Deer Island Secondary Treatment Planning, 247
Sludge in the Nineties, 1246
Statistics-Based Approach to Wastewater Treatment Plant Operations, 180
Sulfide in Wastewater Collection and Treatment Systems, 1338
Water Storage Capacity of Wetland Used for Wastewater Treatment, 191
Wastewater use
Optimization Models for Wastewater Reuse in Irrigation, 673
Water
Biological Denitrification of Water, 196
Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708
Equations Describing Sprinkler Droplet Velocity, 670
PCE Volatilized from Stagnant Water and Soil, 215
Water allocation policy
Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
Network Models of Water Rights and System Operations, 1115
Water balance
Improved Approach to Irrigation Scheduling Programs, 701
Irrigation Scheduling Model with Ground Water and Limited Rooting, 726
Water conservation
Water Requirements Versus Water Availability in Saudi Arabia, 1076
Water content
Improved Approach to Irrigation Scheduling Pro-

grams, 701
 New Basis for Earthwork Specification for Clay Soil, 537
 Random Nature of Soil Porosity and Related Properties, 332
Water costs
 Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
Water demand
 Water Requirements Versus Water Availability in Saudi Arabia, 1076
 Water Resources of the GCC: International Aspects, 1103
Water depth
 Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699
Water discharge
 Inverted V-Notch: Practical Proportional Weir, 733
Water distribution
 Aqueduct and Reservoir Capacities for Distribution Systems, 1106
 Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708
 Computerized Decision Support Systems for Water Managers, 1311
 Control of Irrigation Canal Networks, 665
 DYN² Method for Optimal Control of Water Flow in Open Channels, 728
 Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618
 Hydraulic Engineering, 1322
 Improving Water Delivery System Operation Using Training Simulators, 1110
 On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716
 Optimal Operation of Water Distribution Systems, 1118
 Optimal Pump Operation in Water Distribution, 558
 Optimization Model for Water Distribution System Design, 632
 Pressure and Flow Uncertainty in Water Systems, 1085
 Reliability Analysis of Water Distribution Systems, 1328
 Research Needs in Irrigation and Drainage—1989, 711
 Water Distribution System Design Under Uncertainties, 1111
 Water Resources of the GCC: International Aspects, 1103
 Water Resources Planning and Management, 1342
Water flow
 DYN² Method for Optimal Control of Water Flow in Open Channels, 728
 Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656
 Experiments in Side-Channel Spillways, 587
 Nonisothermal Consolidation in Unsaturated Soil, 522
 Pressure and Flow Uncertainty in Water Systems, 1085

Supercritical Flow in Channel Junctions, 586
 Water Movement in Horizontally Layered Soils, 690
Water hammer
 Measurements of Mixed Transient Flows, 559
 Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440
Water jets
 Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656
Water level fluctuations
 Estimating Terminal Lake Level Frequencies, 1091
Water levels
 Building A Better Wetland, 1245
 Dam-Break Flows in Curved Channel, 637
 Estimating Terminal Lake Level Frequencies, 1091
 Modeling of Unsteady Flow in Curved Channel, 638
Water management
 Building A Better Wetland, 1245
 Computerized Decision Support Systems for Water Managers, 1311
 Control of Irrigation Canal Networks, 665
 Decision Support for Estuarine Water Quality Management, 1120
 Education—Key to Dealing with Social and Environmental Objectives, 1073
 Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672
 Evapotranspiration in Sudan Gezira Irrigation Scheme, 732
 Exurban Living Using Improved Water and Wastewater Technology, 1066
 Gravity Irrigation Management in Bangladesh, 705
 Impact Evaluation Procedures: Theory, Practice, and Needs, 1070
 Irrigated Agriculture and Water Quality in the East, 719
 Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
 LP Operation Model for On-Demand Canal Systems, 709
 Management Model for Control of On-Farm Irrigation, 727
 Optimal Scheduling of Irrigation Machines: I —Model Development, 723
 Optimal Scheduling of Irrigation Machines: II —Applications and Results, 724
 Research Imperatives for Irrigation Science, 689
 Water Requirements Versus Water Availability in Saudi Arabia, 1076
 Water Rights Modeling and Analysis, 1097
 Water-Quality Management Through Combined Simulation-Optimization Approach, 201
Water pipelines
 Channel Tunnel, Texas Style, 1286
 Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618
 Tapping A Glacier, 1235
Water plans
 Education—Key to Dealing with Social and En-

SUBJECT INDEX

- environmental Objectives, 1073
- Water pollution**
- Diagnostic Model of Dispersion in Porous Media, 562
- Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717
- Environmental Engineering Infrastructure: Problems and Needs, 225
- Irrigation-Induced Contamination: How Real a Problem?, 658
- Regulation of Agricultural Drainage to the San Joaquin River, 660
- Screening of Groundwater Contaminants by Travel-Time Distributions, 170
- Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659
- Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186
- Water pollution sources**
- Daily Average Value of Un-ionized Ammonia from Field Measurements, 219
- Water pressure**
- Anisotropic Nature of Jointed Rock Mass Strength, 295
- Pressure and Flow Uncertainty in Water Systems, 1085
- Water quality**
- Approximate Dynamic Lake Phosphorus Budget Models, 190
- Artificial Recharge of Ground Water, 1298
- Daily Average Value of Un-ionized Ammonia from Field Measurements, 219
- Decision Support for Estuarine Water Quality Management, 1120
- Design of Dilution Junctions for Water-Quality Control, 1124
- Environmental Engineering, 1316
- Hydro on Hold, 1248
- Impact of Land Use and NPS Loads on Lake Quality, 179
- Irrigated Agriculture and Water Quality in the East, 719
- Irrigation Impact on Groundwater: Model Study in Humid Region, 720
- Irrigation-Induced Contamination: How Real a Problem?, 658
- Lake Michigan Diversion and Illinois Waterways, 1140
- Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
- Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098
- National Water Conference, 1324
- Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192
- Post-Audit Study of Dieldrin Bioconcentration Model, 181
- Production, Cost, and Increased Salinity in Water, 1123
- Regulation of Agricultural Drainage to the San Joaquin River, 660
- Research Needs in Irrigation and Drainage—1989, 711

Water resources management

- River Quality Modeling: Frequency Domain Approach, 731
- River Quality Modeling: Time Domain Approach, 707
- Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216
- Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151
- Storm Drain Design: Diffusive Flood Routing for PCs, 617
- Stormwater Detention Basin Nutrient Removal Efficiency, 1075
- Time Series Analysis of Water Quality Data in Pearl River, China, 176
- Water Quality Model for Small Tidal Inlet Systems, 152
- Water-Quality Management Through Combined Simulation-Optimization Approach, 201
- Water quality control**
- Decision Support for Estuarine Water Quality Management, 1120
- Design of Urban Runoff Quality Controls, 1314
- Regulation of Agricultural Drainage to the San Joaquin River, 660
- Water resource management**
- Optimum Diversion Plan for Hydropower Scheme, 1084
- Water resources**
- Characteristics and Spatial Variability of Droughts in Idaho, 666
- Economic Impact of Micro Catchment Development, 700
- Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
- Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
- National Water Conference, 1324
- New Federalism and Social and Environmental Goals, 1071
- Potential of Irrigated Agriculture in Syria, 1093
- Research Needs in Irrigation and Drainage—1989, 711
- Use of Stochastic Hydrology in Reservoir Operation, 683
- Water Resources of the GCC: International Aspects, 1103
- Water resources development**
- Private Sector Risk Analysis: Applied to Dam Safety, 765
- Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072
- Staging of Water Resource Developments, 438
- Technology, Society, and Water Management, 1074
- Water resources management**
- Computerized Decision Support Systems for Water Managers, 1311
- Improving Water Delivery System Operation Using Training Simulators, 1110
- Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098
- National Water Conference, 1324
- Network Flow Algorithm Applied to California Aqueduct Simulation, 1080

New Federalism and Social and Environmental Goals, 1071

Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072

Technology, Society, and Water Management, 1074

Variability of Empirical Flow Quantiles, 554

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Water Requirements Versus Water Availability in Saudi Arabia, 1076

Water Resources Management in North China Plain, 1109

Water Resources of the GCC: International Aspects, 1103

Water Resources Planning and Management, 1342

Water reuse

Particle Filtration for Wastewater Irrigation, 693

Water rights

Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323

Network Models of Water Rights and System Operations, 1115

Water Rights Modeling and Analysis, 1097

What a Layperson Needs to Know About Water Rights, 691

Water storage

Estimating Terminal Lake Level Frequencies, 1091

Storage of Heated Water in Underground Openings, 480

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Water supply

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Dependence of Lunar Bases on Phobos and Deimos, 39

Design of Dilution Junctions for Water-Quality Control, 1124

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Improving Water Delivery System Operation Using Training Simulators, 1110

Network Models of Water Rights and System Operations, 1115

Production, Cost, and Increased Salinity in Water, 1123

Regionalization in Water Supply Industry: Status and Needs, 1094

Reliability Analysis of Water Distribution Systems, 1328

Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083

Use of Stochastic Hydrology in Reservoir Operation, 683

Water and Urban Land-Use Planning in Cali, Colombia, 1119

Water Requirements Versus Water Availability in Saudi Arabia, 1076

Water Resources Planning and Management, 1342

Water Supply Yield Analysis for the Washington Metropolitan Area, 1086

Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343

Water supply forecasting

Characteristics and Spatial Variability of Droughts in Idaho, 666

Water Requirements Versus Water Availability in Saudi Arabia, 1076

Water supply systems

Building in Reservoirs, 1179

Network Flow Algorithm Applied to California Aqueduct Simulation, 1080

Optimal Operation of Water Distribution Systems, 1118

Reliability Analysis of Water Distribution Systems, 1328

Water surface profiles

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Water table

Nonlinear Steady State Seepage into Drains, 685

Steady Drainage of Landfill Covers and Bottom Liners, 209

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Water temperature

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Storage of Heated Water in Underground Openings, 480

Water transportation

DYN² Method for Optimal Control of Water Flow in Open Channels, 728

Water treatment

Adsorption Kinetics in GAC Systems for Water Treatment, 147

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Breakthrough Curves in Granular Media Filtration, 188

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Exurban Living Using Improved Water and Wastewater Technology, 1066

Harmonic Mean Conductivity in Declining Rate Filters, 169

Membranes in Water Treatment, 1220

Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186

Water treatment plant

Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194

Water treatment plants

Automated Design of Wastewater Plants, 1228

Buying Tomorrow's Water, 1216

Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100

Tapping A Glacier, 1235

Water tunnels

Optimum Diversion Plan for Hydropower Scheme, 1084

Water use

Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672

SUBJECT INDEX

Wave reflection

Hydraulics of Catenary Irrigation Trail Tubes, 669
Irrigated Agriculture and Water Quality in South, 718

Irrigation Scheduling Model with Ground Water and Limited Rooting, 726

LP Operation Model for On-Demand Canal Systems, 709

Production, Cost, and Increased Salinity in Water, 1123

Rainfall Intervention Analysis for On-Line Applications, 1096

Water Resources Planning and Management, 1342

Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343

Water waves

Improved Algorithm for Stream Function Wave Theory, 1133

Interaction of Finite Amplitude Waves with Platforms or Docks, 1126

Waterborne diseases

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Waterfront facilities

Ports '89, 1325

Watersheds

Continuous Distributed Model of Storage Dominated Watershed Runoff, 681

Economic Impact of Micro Catchment Development, 700

Prediction of Class A Pan Evaporation in Southwest Idaho, 671

Sensitivity Study of Detention Basins in Urbanized Watershed, 1069

Toward a New Rational Method, 622

Waterways

Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

Cold Regions Engineering, 1308

Lake Michigan Diversion and Illinois Waterways, 1140

Mathematical Modeling of Fluvial Sand Delivery, 1144

Minimization of Frazil-Ice Production by River-Flow Regulation, 623

Panama Canal: Its Past and Its Future, 249

Transitional Flow in Channel Junctions, 564

Wave action

Analysis of Natural Waves by Local Approximations, 1148

Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171

Dam-Break Flows in Curved Channel, 637

Random Wave Runup Height on Gentle Slope, 1164

Wave diffraction

Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147

Wave dispersion

Groupiness Factor and Wave Height Distribution, 1131

Interaction of Finite Amplitude Waves with Platforms or Docks, 1126

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Wave energy

Compendium of International Ocean Energy Activities, 1309

Model Test Results of Scour Along Breakwaters, 1129

Wave equations

Energy Transfer Mechanism in SPT, 521

Hydrodynamic Pressure on Gravity Dams Subjected to Ground Motions, 299

Validity of Smith Model in Pile Driving Analysis, 517

Wave forces

Applications of Headland Control, 1143

Breaking Wave Forces on Vertical Walls, 1128

Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173

Wave Forces on Pile in Surface Zone, 1159

Wave generation

Performance of a Wedge-Type Absorbing Wave Maker, 1125

Wave groups

Complex Envelope of Surface Gravity Waves, 1166

Groupiness Factor and Wave Height Distribution, 1131

Random Wave Runup Height on Gentle Slope, 1164

Wave height

Dam-Break Flows in Curved Channel, 637

Groupiness Factor and Wave Height Distribution, 1131

Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158

List of Sea-State Parameters, 1172

Random Wave Runup Height on Gentle Slope, 1164

Rubble-Mound Breakwaters with S-Shape Design, 1160

Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146

Wave measurement

Improved Algorithm for Stream Function Wave Theory, 1133

Wave propagation

Ray-Path Curvature in Shallow Seismic Investigations, 516

Wave Transmission Over Submerged Breakwaters, 1165

Wave reflection

Model Test Results of Scour Along Breakwaters, 1129

Sines Revisited, 1145

Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147

Wave Transmission Over Submerged Breakwaters, 1165

Wave refraction

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Wave runup

Maximum Periodic Wave Run-up on Smooth Slopes, 1167

Random Wave Runup Height on Gentle Slope, 1164

Rubble-Mound Breakwaters with S-Shape Design, 1160

Wave Overtopping on Coastal Structures, 1139

Wave Transmission Over Submerged Breakwaters, 1165

Wave spectra

Complex Envelope of Surface Gravity Waves, 1166

Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161

List of Sea-State Parameters, 1172

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Waves

Analysis of Natural Waves by Local Approximations, 1148

Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171

Applications of Headland Control, 1143

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

Bottom Boundary Layer Under Nonlinear Wave Motion, 1127

Complex Envelope of Surface Gravity Waves, 1166

Hydrodynamic Forces on Seabed Pipelines, 1136

Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158

List of Sea-State Parameters, 1172

Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280

Model Test Results of Scour Along Breakwaters, 1129

Performance of a Wedge-Type Absorbing Wave Maker, 1125

Response of Marine Pipelines in Scour Trenches, 1155

Roughness Values for Overland Flow in Subcatchments, 674

Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319

Sines Revisited, 1145

Stability of Reef Breakwaters, 1138

Stem Waves Along Breakwater, 1163

Twenty-first Coastal Engineering Conference, 1340

Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147

Wave Overtopping Generated Flow Through Offshore Breakwater Gaps, 1151

Wave Overtopping on Coastal Structures, 1139

Weather

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

Weather in Construction Contracts, 76

Weather data

Modeling Yields from Rainfall and Supplemental

Irrigation, 677

Weather forecasting

Estimating Precipitation Impacts for Scheduling, 96

Weather modification

Research Needs in Irrigation and Drainage—1989, 711

Weathering

Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892

Kinetics of Reaction of SO_2 with Marble, 773

Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774

Web beams

Behavior of Rolled Section Web Under Eccentric Edge Compressive Loads, 880

Webs

Behavior of Rolled Section Web Under Eccentric Edge Compressive Loads, 880

Wedges

Geometry of Arrested Thermal Wedges, 1174

Weirs

Design of Efficient Side-Channel Spillway, 624

Detention Pond Sizing for Multiple Return Periods, 589

Inverted V-Notch: Practical Proportional Weir, 733

Sloping Crest Crump Weir, 676

Welded tanks

Ashland Tank Collapse Investigation, 51

Brittle Fracture and Collapse of Large Grain-Storage Tank, 52

Welding

Application of Robotics in Bridge Deck Fabrication, 62

Compression Tests of Welded Channel Section Columns, 832

Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892

Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810

Welds

Elastic Stability of Cylindrical Shells with Weld Depressions, 860

Wells

Bias in Groundwater Samples Caused by Wellbore Flow, 566

Multipoint Monitoring, 1253

Nonlinear Flow Toward Wells, 561

Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608

Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650

Wetlands

Building A Better Wetland, 1245

High Hopes for Cattails, 1215

Water Storage Capacity of Wetland Used for Wastewater Treatment, 191

Wetting front

Water Movement in Horizontally Layered Soils, 690

SUBJECT INDEX

Whales

A Seawall for Sea Mammals, 1183

Wharves

New Wharf Covers Trident Submarines, 1182

White noise

Characteristics of Response to Nonstationary

White Noise: Theory, 380

Characteristics of Response to Nonstationary

White Noise: Applications, 381

Width

Simulating Effect of Channel Changes on Stream Infiltration, 649

Width of Straight Alluvial Channels, 568

Wilderness areas

Remote Oil and Gas Facility Construction, 73

Wildlife

Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659

Wind

Deer Isle Bridge: Efficacy of Stiffening Systems, 923

Deer Isle Bridge: Field and Computed Vibrations, 924

Deterministic Model for Wind-Induced Oscillations of Buildings, 272

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Mitigation of Wind Effects on Aerospace Launch Facilities, 24

Paradox Unresolved, 318

PC-Based Data Acquisition System for Structural Monitoring, 123

Simulation of Wind-Induced Water Currents, 616

Strategies for Mitigating Damage to Metal Building Systems, 26

Strategies for Wind Damage Mitigation—Summary, 36

Transient Wind-Induced Internal Pressures, 355

Ultimate Strength of Wood Walls in Tension—Pilot Study, 894

Wind Damage to Masonry Buildings, 37

Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Wind Design Problems with Building Structures During Construction, 29

Wind Induced Vibration of Two Flexible Cylindrical Structures, 392

Wind forces

Blockage Correction for Sharp-Edged Bluff Bodies, 360

Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38

Mitigation of Wind Effects on Aerospace Launch Facilities, 24

Review of Standard Practice for Wind-Resistant Manufactured Housing, 27

Simulation of Wind-Induced Water Currents, 616

Strategies for Wind Damage Mitigation—Summary, 36

Wind Damage to Masonry Buildings, 37

Wind Induced Vibration of Two Flexible Cylindrical Structures, 392

Wind Response Spectrum, 390

Wind loads

Aerodynamic Model Tests of Tall Buildings, 300

Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393

Control Systems of Building Structures by Active Cables, 959

Load Transfer Mechanisms in Wind-Loaded Cylinders, 409

Wind speed

New Method for Prediction of Extreme Wind Speeds, 315

Strategies for Mitigating Damage to Metal Building Systems, 26

Wind tunnel models

Aerodynamic Model Tests of Tall Buildings, 300

Wind tunnel test

Aerodynamic Model Tests of Tall Buildings, 300

Transient Wind-Induced Internal Pressures, 355

Wind velocity

Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38

Winter

Weather in Construction Contracts, 76

Wire rope

Effect of Length on Fatigue Life of Long Thin Continuous Components, 351

Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387

Wood

Binders for Snow Roads and Runways in Antarctica, 131

Finite Element Modeling of Wood Diaphragms, 817

Glitches in Flitch Beam Design, 1260

Modeling Vertically Mechanically-Laminated Lumber, 946

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Steel-Reinforced Glued Laminated Timber, 811

Wood beams

Steel-Reinforced Glued Laminated Timber, 811

Wood construction

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

Wooden piles

Durability of Posted and Epoxy-Grouted Timber Piles, 834

Wooden structures

Building Onto History, 1293

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

Modeling Laterally Loaded Light-Frame Buildings, 797

Predicting Creep of Nailed Lumber-to-Plywood Joints, 399

Reliability-Based Design of Wood Structural Systems, 886

Screaming Structures, 1277

Ultimate Strength of Wood Walls in Tension—Pilot

Wooden structures

Wooden structures

Study, 894
Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25

Yield

Application of Orthotropic Failure Criterion to Wood, 316
Estimation of the Inelastic Longitudinal Abutment Stiffness of Bridges, 928
Residual Stresses in Beams with Yielding During Unloading, 829

1989 ASCE TRANSACTIONS

Yield strength

Buckling Strength of Partially Restrained I-Beams, 862

Yield surface

Yield Surfaces for I-Sections with Bimoments, 968

Young's modulus

On Static Modulus of Elasticity of Normal-Weight Concrete, 940

Author Index

- Abascal, Ramon**
see Dominguez, Jose, 319
- Abbott, Eldon L.**
see Hansmire, William H., 454
- Abdel-Halim, Mohamed A. H.**
Analytical Study for Concrete Confinement in Tied Columns, 954
- Abdulmumin, Salisu**
Irrigation Scheduling Model with Ground Water and Limited Rooting, 726
- Abendroth, Robert E.**
Abutment Pile Design for Jointless Bridges, 960
Cyclic Load Behavior of Bolted Timber Joint, 935
Fatigue Behavior of Composite Metal Deck Slabs, 790
- Abkowitz, Mark**
Critical Issues in Safe Transport of Hazardous Materials, 1055
- Abraham, Dulcy M.**
see Bernold, Leonhard E., 122
- Abt, S. R.**
Cap Stabilization for Reclaimed Uranium Sites, 443
- Abt, Steven R.**
see Maynard, Stephen T., 604
- Abu-Hijleh, Samer F.**
Schedule-Based Construction Incentives, 87
- Abu-Lebdeh, Taher M.**
see Abdel-Halim, Mohamed A. H., 954
- Abu-Rizalza, O. S.**
Urban Groundwater Rise Control: Case Study, 702
- Ackermann, Norbert L.**
see Pasquarell, Gary C., 341
- Adams, Charles E., Jr.**
see Hochstein, Anatoly B., 1153
- Adebisi, Olusegun**
Influence of Stopped Delay on Driver Gap Acceptance Behavior, 1036
- Adin, Avner**
Breakthrough Curves in Granular Media Filtration, 188
Particle Filtration for Wastewater Irrigation, 693
- Adkins, Dan F.**
Freeze-Thaw Deterioration of Concrete Pavements, 776
- Advani, S. H.**
see El-Tahan, W. W., 322
- Afshar, Abbas**
Optimization Models for Wastewater Reuse in Irrigation, 673
- Agarwal, R. K.**
see Saran, Swami, 542
- Agiralloglu, Necati**
Hood Characteristics for Siphon-Shaft Spillways, 588
- Agrawal, G.**
see Thevanayagam, S., 537
- Agibe, Donald E.**
Production, Cost, and Increased Salinity in Water, 1123
- Ahlborn, Theresa M.**
see Sandberg, L. Bogue, 858
- Ahmad, Irtishad**
see Minkarah, Issam, 745
- Ahmadi, Goodarz**
see Orabi, Ismail I., 264
see Ounis, Hady, 394
see Su, Lin, 385
- Ahrens, John**
see Walton, Todd L., Jr., 1167
- Ahrens, John P.**
Stability of Reef Breakwaters, 1138
- Ahtchi-Ali, Faouzi**
see Poran, Chaim J., 508
- Aida, Tadayoshi**
Dynamic Stability of Thin-Walled Structural Members Under Periodic Axial Torque, 266
- Ajayi, Owolabi**
Numerical Estimation of Aquifer Parameters Using Two Observational Wells, 608
- Akan, A. Osman**
Detention Pond Sizing for Multiple Return Periods, 589
Time of Concentration Formula for Pervious Catchments, 713
- Akers, David J., ed.**
Creative Application of Materials Engineering, 1313
- Akhtaruzzaman, Ali A.**
see Wafa, Faisal F., 949
- Akin, J. E.**
see Boriek, A. M., 784
- Akin, John E.**
Numerical Solution for Response of Beams With Moving Mass, 792
- Aktan, H. M.**
see Youssef-Agha, W., 820
- Al-Assar, Ramiz**
see Khasnabis, Snehamay, 1035
- Albrecht, Pedro**
Fatigue of Eight-Year Weathered A588 Steel Stiffeners in Salt Water, 892
see Saadatmanesh, Hamid, 926, 927, 962
- Al-Dulaijan, Salah U.**

- see Stevens, James D., 60
- Alhamad, Abdulaziz**
see Wen, Robert K., 861
- Al-Kadi, Ibrahim**
Selection of GPS Receiver for Survey Applications, 986
- Al-Khalat, Husain**
Problems of Housing in Kuwait, 1067
- Al-Khalidi, O.**
see Ismael, Nabil F., 546
- Allam, Mohamed N.**
see Rizaiza, Omar S. Abu, 1076
- Allen, Robert H.**
see Oppenheim, Irving J., 837
- Al-Mandil, M. Y.**
see Baluch, M. H., 777
- Almustafa, Riyadh A.**
see Poston, Randall W., 19
- Al-Nour, L. A. R.**
see Baluch, M. H., 777
- Al-Qarra, Husam H.**
Finite Deflections of Sandwich Beams and Plates by Finite Element Method, 343
- Al-Saadoun, S. S.**
Interactive Design Optimization of Framed Structures, 105
- Al-Salih, A. H.**
see Townson, J. M., 584
- Altschaeffl, A. G.**
see Thevanayagam, S., 537
- Alvarado, Manuel A.**
Mode I Fracture in Concrete Using Center-Cracked Plate Specimens, 285
- Amadel, B. P.**
see Atkinson, R. H., 922
- Amadel, Bernard**
Anisotropic Nature of Jointed Rock Mass Strength, 295
Estimation of Uplift Pressure in Cracks in Older Concrete Gravity Dams, 436
Estimation of Uplift Pressures in Cracks in Older Concrete Gravity Dams 2: Effect of Head Losses in Drain Pipes on Uplift, 437
- Amaral, M. F.**
see Tucci, C. E. M., 1105
- Amir, Hossain M.**
Nonlinear Mixed-Discrete Structural Optimization, 822
- Ammerman, Olga Velez**
R/C Beam-Column-Slab Subassemblages Subjected to Lateral Loads, 863
- Amu, Olanrewaju**
see French, Catherine Wolfram, 805
- Amundsen, Tomm**
see Andersen, Knut H., 534
see Dyvik, Rune, 533
- Andersen, Knut H.**
Model Tests of Gravity Platforms: Interpretation, 534
see Dyvik, Rune, 533
- Anderson, A. M.**
see Johnson, R. A., 140
- Anderson, David A.**
see Sebaaly, Peter E., 1040
- Anderson, James**
see Scheader, C. Edward, 1179
- Anderson, James C.**
Uncertainties in Establishing Design Earthquakes, 5
- Ang, A. H. -S., ed.**
Structural Design, Analysis and Testing, 1335
- Ansari, Atilla M.**
Undrained Behavior of Clay Under Cyclic Shear Stresses, 500
- Aoki, Hirohumi**
see Tagawa, Yasuhisa, 908
- Archer, Michael C.**
see Chung, Francis I., 1080
- Arditi, David**
Impact Analysis of Owner-Directed Acceleration, 68
- Arici, Marcello**
Reciprocal Conjugate Method for Space Curved Bars, 818
- Aristizabal-Ochoa, J. Dario**
see Gharpuray, Vasant, 104
- Armeniadis, C. D.**
see Boriek, A. M., 784
- Arndt, Roger E. A.**
Cavitation Erosion in Hydroturbines, 626
- Arnell, Nigel W.**
Expected Annual Damages and Uncertainties in Flood Frequency Estimation, 1078
- Arnold, Robert G.**
see Logan, Bruce E., 154
- Arnold, S. M.**
Creep Buckling of Cylindrical Shell Under Variable Loading, 327
- Arnold, Uwe**
Decision Support for Estuarine Water Quality Management, 1120
- Arora, J. S.**
see Al-Saadoun, S. S., 105
- Arp, Larry Dean**
see Lin, T. D., 22
- Arseneau, D.**
see Quek, See Hean, 981
- Arya, A. S.**
see Desai, J. P., 788
- Asaeda, Takashi**
Sediment Entrainment in Channel with Rippled Bed, 569

- ASCE Committee on Construction Equipment and Techniques**
Concrete Bridge Design and Construction in the United Kingdom, 100
- ASCE Committee on Construction Equipment and Techniques**
Use of Geotextiles and Geocomposites in the United Kingdom, 75
- ASCE Committee on Urban Goods Movement Issues and Problems of Moving Goods in Urban Areas**, 1015
- ASCE Construction Division Committee on Construction of Nuclear and Power Generation Facilities**
Positive Influences of Nuclear Construction, 86
- ASCE Research and Education Administrative Committee**
Research Needs in Irrigation and Drainage—1989, 711
- Ashton, George D.**
see Nakato, Tatsuki, 133
- Astaneh, Abolhassan**
Cyclic Behavior of Double Angle Connections, 852
- Aston, Gary**
see Williams, Frederic W., 851
- Atkinson, Edmund**
Prediction of Sediment Sampling Error at Nozzle, 653
- Atkinson, J. F.**
see Puckett, J. A., 894
- Atkinson, R. H.**
Response of Masonry Bed Joints in Direct Shear, 922
- Atmatzidis, D. K.**
see Zebowitz, S., 545
- Atmatzidis, Dimitrios K.**
see Finno, Richard J., 504
- Atwater, James**
see Zeiss, Chris, 1064, 1068
- Auer, Martin T.**
Variability in Photosynthesis: Impact on DO Models, 197
- Austin, Jeffrey S.**
see White, Charles R., 764
- Austin, M. A.**
CSTRUCT: Computer Environment for Design of Steel Structures, 115
- Austin, T. Al, ed.**
National Water Conference, 1324
- Austin, Teresa**
1990: Decade of Natural Disaster Reduction, 1294
- Austin, Walter J.**
see Clift, Charles D., 934
- Avent, R. Richard**
Durability of Posted and Epoxy-Grouted Timber Piles, 834
Heat-Straightening of Steel: Fact and Fable, 952
- Heat-Straightening Prototype Damaged Bridge Girders**, 884
- Avery, Earl V.**
see Hatch, Ronald R., 994
- Axhausen, Kay W.**
Simulating Activity Chains: German Approach, 1037
- Axten, Gregory W.**
see Day, Robert W., 478
- Ayoub, Essam F.**
see Leissa, Arthur W., 432
- Ayyub, Bilal M.**
see Saadatmanesh, Hamid, 926, 927, 962
- Azad, A. K.**
see Baluch, M. H., 777
- Aziznamini, Atorod**
Static and Cyclic Performance of Semirigid Steel Beam-To-Column Connections, 964
- Azzouz, Amr S.**
Cyclic Behavior of Clays in Undrained Simple Shear, 482
see Malek, Aziz M., 481
- Baba, S.**
Active Optimal Control of Structure Using Optimal Observer, 421
- Babar, Nadeem**
see Paulson, Boyd C., Jr., 121
- Babarutski, S.**
Experimental Investigation of Shallow Recirculating Flows, 602
- Babić, Marijan**
Simple Mean Free Path Theory for Stresses in a Rapid Granular Flow, 340
- Bachman, John A.**
HSR Vehicle Performance Characteristics, 1018
- Baddour, Raouf E.**
Surface Thermal Plume in Channel, 600
- Baecher, Gregory B.**
see Wu, Tien H., 455
- Baek, N. H.**
Modeling of Enhanced Biodegradation in Unsaturated Soil Zone, 150
- Baffaut, C.**
Expert System for Calibrating SWMM, 1089
- Bagchi, Amalendu**
Characterization of MSW Incinerator Ash, 167
- Ballard, A. James**
Water Jets Fight Silt, 1180
- Baines, W. Douglas**
see Chu, Vincent H., 578
- Baker, Clyde, Jr.**
Bells Under Bells, 1295
- Baker, D. J.**
HIBIC: Expert System for Highway Bridge Dynamics, 124

- Balachandrar, R.**
see Ramamurthy, A. S., 360
- Baldwin, Kenneth C.**
see Swift, M. Robinson, 1132
- Balendra, T.**
Steady State Vibration of Subway-Soil-Building System, 270
- Balendra, Thambirajah**
Deterministic Model for Wind-Induced Oscillations of Buildings, 272
- Bales, Jerad D.**
Sand Transport in Texas Tidal Inlet, 1152
- Baligh, Molsen M.**
see Azzouz, Amr S., 482
see Malek, Aziz M., 481
- Ballarini, Roberto**
see Plesha, Michael E., 426
- Baluch, M. H.**
Concrete Degradation Due to Thermal Incompatibility of Its Components, 777
- Bangs, A. S.**
Composite Icewall Design and Analysis, 126
- Banon, H.**
Methodology for Assessing Reliability of Tension Leg Platform Tethers, 920
- Banset, Elizabeth A.**
Communications Failure in Hyatt Regency Disaster, 245
- Banthia, Nemkumar**
Effect of Early Freezing on Permeability of Cement Paste, 778
Marine Curing of Steel Fiber Composites, 775
- Barber, M. J.**
Binders for Snow Roads and Runways in Antarctica, 131
- Bard, Ronald J., ed.**
Excellence in the Constructed Project, 1317
- Bardossy, A.**
see Bogardi, I., 483
- Bargiela, Andrzej**
Pressure and Flow Uncertainty in Water Systems, 1085
- Barlaz, Morton A.**
Mass-Balance Analysis of Anaerobically Decomposed Refuse, 207
- Barnett, Jonathan R.**
see Fitzgerald, Robert W., 1218
- Barnett, M. J. N.**
Role of Private Sector Finance, 224
- Barawell, Thomas D., Jr., ed.**
Computing in Civil Engineering: Computers in Engineering Practice, 1312
- Barr, Douglas W.**
Quick Response on the Mississippi, 1256
- Barwinski, Klaus**
see Beckmann, Angela, 1006
- Barzegar, Fariborz**
Analysis of RC Membrane Elements with Anisotropic Reinforcement, 823
- Basagioti, Javier**
see Huang, Jerry Y. C., 141
- Basco, David R.**
Limitations of de Saint Venant Equations in Dam-Break Analysis, 605
- Bates, Marcia H.**
Environmental Engineering Infrastructure: Problems and Needs, 225
- Batterman, Stuart A.**
Selection of Receptor Sites for Optimized Acid Rain Control Strategies, 203
- Bauer, M. F.**
see Tatum, C. B., 70
- Baumgartner, D. J.**
see Roberts, Philip J. W., 550, 551, 552
- Baumli, George R., ed.**
Legal, Institutional, Financial and Environmental Aspects of Water Issues, 1323
- Baus, Ronald L.**
AASHTO Flexible Pavement Design Equation Study, 1052
- Bazant, Zdenek P.**
Initial Postcritical Analysis of Asymmetric Bifurcation in Frames, 956
Measurement of Characteristic Length of Nonlocal Continuum, 309
Segmental Box Girder: Deflection Probability and Bayesian Updating, 937
Solidification Theory for Concrete Creep—I. Formulation, 368
Solidification Theory for Concrete Creep II. Verification and Application, 369
- Beatty, D. A.**
see Hagerty, D. J., 1149
- Beck, Norman**
GPS Processing Methods: Comparison with Precise Trilateration, 992
- Beckmann, Angela**
Engineering Applications of GPS Differential Surveying, 1006
- Bedford, Keith W.**
Sediment Entrainment and Deposition Measurements in Long Island Sound, 8
- Bedient, Philip B.**
see Todd, David A., 179
- Behr, R. A.**
Potential Errors in Approximate Methods of Structural Analysis, 845
- Behr, Richard A.**
Shear Connector Design for Composite Flexural Members, 814
- Beliveau, Yvan J.**
see Lundberg, Eric J., 94
- Bell, Chris A.**
see Kim, Ok-Kee, 1038

AUTHOR INDEX

Blair

- Bell, Glenn R.**
Project Peer Review: Results of the Structural Failures II Conference, 56
- Bell, Roy A.**
see D'Orazio, Timothy B., 495
- Belleudy, P. J.**
see Rahuel, J. L., 641
- Benabdallah, Salah**
Computer Graphics in Truss-Model Design Approach, 120
- Benjamin, Neal**
see Hinze, Jimmie, 65
- Bennett, Gordon D.**
see Reilly, Thomas E., 566
- Benoit, R. E.**
see Gayle, B. P., 196
- Bentur, Arnon**
Curing Effects, Strength and Physical Properties of High Strength Silica Fume Concretes, 772
Silica Fume Treatments as Means for Improving Durability of Glass Fiber Reinforced Cements, 781
- Ben-Zvi, Arie**
Toward a New Rational Method, 622
- Bernard, Erik M.**
Rx for Dam Repair, 1278
- Bernold, Leonhard E.**
Emulation for Control System Analysis in Automated Construction, 122
Simulation of Nonsteady Construction Processes, 69
- Bertero, Vitelmo V.**
Earthquake Simulator Testing of Concentric Braced Dual System, 899
see Anderson, James C., 5
see Whittaker, Andrew S., 796
- Berthouex, P. Mac**
see Stevens, David K., 195
- Berthouex, P. M.**
Statistics-Based Approach to Wastewater Treatment Plant Operations, 180
- Berzins, William E.**
Information Systems and the Economics of Engineering Services, 737
- Beskos, D. E., ed.**
Boundary Element Methods in Structural Analysis, 1302
- Beskos, Dimitri E.**
Dynamics of Saturated Rocks. I: Equations of Motion, 323
Dynamics of Saturated Rocks. II: Body Waves, 324
Dynamics of Saturated Rocks. III: Rayleigh Waves, 325
- Besombes-Vailhé, Jean**
see Foussard, Jean-Noël, 162
- Bettigole, Neal H.**
see Darlow, Mark S., 933
- Betz, John F.**
see Krauthammer, Theodor, 833
- Beverage, Joseph P.**
Comparison: US P-61 and Delft Sediment Samplers, 654
- Bewtra, Jatinder**
see Zytner, Richard G., 215
- Bhallamudi, S. Murty**
see Dammuller, D. C., 638
- Bhargava, D. S.**
Modeling for Class-I Sedimentation, 214
- Bhaskar, Nageshwar R.**
Comparison of Method of Residuals and Cluster Analysis for Flood Regionalization, 1121
- Bhaskara Reddy, G. C.**
see Raamachandran, J., 289
- Bhimaraddi, Alavandi**
Finite Element Analysis of Orthogonally Stiffened Annular Sector Plates, 391
- Bhowmik, Nani G.**
Lake Michigan Diversion and Illinois Waterways, 1140
- Bhuiyan, S. I.**
see Ghani, M. A., 705
- Bichara, Adel F.**
Potential of Irrigated Agriculture in Syria, 1093
- Bicudo, J. R.**
Measurement of Reaeration in Streams: Comparison of Techniques, 200
- Bieniek, Maciej P.**
see Levy, Alan J., 353
- Biggar, J. W.**
see Morkoc, F., 707
see Morkoo, F., 731
- Bijker, Eco W.**
see Sakakiyama, Tsutomu, 1162
- Billet, P.**
Soil-Sheet Pile Interaction in Vibro-Piling, 506
- Birkemoe, Peter C.**
see Packer, Jeffrey A., 919
- Birman, Victor**
Axisymmetric Vibrations of Reinforced Orthotropic Shallow Spherical Caps, 34
- Biswas, Asit K.**
Irrigation in Nepal: Opportunities and Constraints, 734
- Biswas, Nihar**
see Zytner, Richard G., 215
- Bjæger, Peter**
Parametric Sensitivity in First Order Reliability Theory, 361
see Ditlevsen, Ove, 345
- Blair, Bruce R.**
Practical Applications of Global Positioning System, 995

- Blandford, George E.**
 see Hardin, Bobby O., 490
 see Hill, Christopher D., 839
- Bloomquist, D. G.**
 see McVay, M. C., 496
 see Townsend, Frank C., 540
- Boardman, G. D.**
 see Gayle, B. P., 196
- Bobee, Bernard**
 see Nguyen, Van-Thanh-Van, 591
- Bock, Yehuda**
 Simultaneous Orbit and Network Adjustment in Tennessee, 980
- Boedeker, Ralph H.**
 see Leshchinsky, Dov, 528
- Boemer, Lois E.**
 Road to Successful Sales—A Three-Step Process, 761
- Bofang, Zhu**
 Finite Element Analysis of Effect of Pipe Cooling in Concrete Dams, 91
- Bogardi, I.**
 Reliability Model for Soil Liners: Initial Design, 483
- Bogdanoff, J. L.**
 Effect of Length on Fatigue Life of Long Thin Continuous Components, 351
- Boggs, Daryl W.**
 Aerodynamic Model Tests of Tall Buildings, 300
- Boggs, Howard**
 see Amadei, Bernard, 436, 437
- Boghtrati, Alireza**
 Use of STABL Program in Tied-back Wall Design, 476
- Bognár, L.**
 Load-Shortening Relationships for Bars, 889
- Bohac, C. E.**
 see Brown, R. T., 220
- Bohac, Charles E.**
 Underwater Dam and Embayment Aeration for Striped Bass Refuge, 166
 see Kim, Byung R., 439
- Bohnhoff, David R.**
 Modeling Vertically Mechanically-Laminated Lumber, 946
- Boman, Brian J.**
 LP Operation Model for On-Demand Canal Systems, 709
- Bondada, Murthy V. A., ed.**
 Automated People Movers II: New Links for Land Use—Automated People Mover Opportunities for Major Activity Centers, 1299
- Borah, Deva K.**
 Scour-Depth Prediction Under Armoring Conditions, 633
- Boriek, A. M.**
 Setting Stresses in Polymer Composites with Multiple-Size Particles, 784
- Borino, G.**
 see Perego, U., 434
- Borojerdi, Alireza**
 see French, Catherine Wolfram, 785
- Boscardin, Marco D.**
 Building Response to Excavation-Induced Settlement, 446
- Bosznay, Miklós**
 Generalization of SCS Curve Number Method, 668
- Boutros, Medhat K.**
 see Goel, Subhash C., 903
- Bouwer, Edward J.**
 Biotransformation of Aromatics in Strip-Pit Pond, 185
- Bouwer, Herman**
 Agriculture and Groundwater Quality, 1242
 Effect of Water Depth in Groundwater Recharge Basins on Infiltration, 699
- Bouwkamp, Jack G.**
 see Shahrivar, Farid, 827
- Bowen, James D.**
 Storm Drain Design: Diffusive Flood Routing for PCs, 617
- Bowers, Robert**
 Safer Dams, 1259
- Bowiby, W.**
 see Wayson, R. L., 1016
- Bowman, Brian L.**
 Impact of Fuel Conservation Measures on Safe Truck Downgrade Speeds, 1039
- Boyer, L. T.**
 see Farid, Foad, 66
- Bradford, Mark A.**
 Buckling Strength of Partially Restrained I-Beams, 862
- Brady, D. K.**
 see Liong, S. Y., 674
- Braga, B. P. F.**
 see Tucci, C. E. M., 1105
- Brahma, Chandra S.**
 Summer Institutes for Minority High School Students, 236
- Brand, Nicholas M.**
 Operating and Maintenance Costs of the TGV High-Speed Rail System, 1017
- Brandon, T. L.**
 Factors Influencing Thermal Resistivity of Sands, 543
 Thermal Instability in Buried Cable Backfills, 448
- Brazil, L. E., ed.**
 see Labadie, J. W., ed., 1311
- Bree, Jim**
 "Snaking" of Floating Marine Oil Hose Attached to SPM Buoy, 279

- Breen, John F.**
see Poston, Randall W., 19
- Bremen, Roger**
Experiments in Side-Channel Spillways, 587
- Brendecke, Charles M.**
Network Models of Water Rights and System Operations, 1115
- Brennan, Terry**
see Osborne, Michael C., 175
- Brenner, Brian R.**
Automating Design of Boston's Artery, 1229
- Brennodden, Harald**
see Wagner, David A., 1137
- Brierly, Gary**
Tunnel Talk, 1288
- Briggs, Michael J.**
see Vincent, Charles L., 1141
- Britson, Wes**
Building Onto History, 1293
- Broeren, Sally McConkey**
see Singh, Krishan P., 1108
- Broms, Bengt B.**
see Wong, Kai S., 494
- Bromwell, Leslie G.**
see Vick, Steven G., 492
- Broner, Israel**
Optimal Scheduling of Irrigation Machines: I
—Model Development, 723
Optimal Scheduling of Irrigation Machines: II
—Applications and Results, 724
- Broome, Taft H., Jr.**
Econometrical Analysis of Combined Dynamical Systems, 395
- Brown, J. S.**
Training the Waste Watchers, 1254
- Brown, R. L.**
see Barber, M. J., 131
- Brown, R. T.**
Measurement of Upwelling Flow from Air Diffuser, 220
- Bruna, P.**
see Ganoulis, J., 621
- Brunner, Calvin R.**
On-Site Incineration, 1212
- Bruno, Luigi**
see Packer, Jeffrey A., 919
- Brunson, Ronald F.**
Peer Review in the Public Sector, 223
- Bruschi, Roberto**
see Sumer, B. Mutlu, 1155
- Buchberger, Steven G.**
Design of Wastewater Storage Ponds at Land Treatment Sites. I: Parallels with Applied Reservoir Theory, 182
Design of Wastewater Storage Ponds at Land Treatment Sites. 2: Equilibrium Storage Performance Functions, 183
- Bucher, C. G.**
Stochastic Stability of Bridges Considering Coupled Modes: II, 286
see Kardara, A., 370
- Bucher, Stephen A.**
see Baker, Clyde, Jr., 1295
- Buckle, Gregory**
see Duplancic, Neno, 1296
- Buerk, Gunter**
High Tech on Campus, 1195
- Bugliarello, George**
Hydraulic Engineering: Global Challenge, 599
- Bulleit, William M.**
Steel-Reinforced Glued Laminated Timber, 811
- Bullock, Geoffrey N.**
Performance of a Wedge-Type Absorbing Wave Maker, 1125
- Burati, James L., Jr.**
see Davis, Kent, 83
- Burau, R. G.**
Selenium in Arid and Semi-arid Soils, 661
- Burke, Martin P., Jr.**
Bridge Design and the "Bridge Aesthetics Bibliography", 838
- Burn, Donald H.**
Cluster Analysis as Applied to Regional Flood Frequency, 1107
Water-Quality Management Through Combined Simulation-Optimization Approach, 201
- Burr, Julia L.**
see Gordon, John A., 163
- Burridge, Paul B.**
Centrifuge Study of Faulting Effects on Tunnel, 499
- Bury, Karl V.**
see Kreuzer, Harald, 290
- Bushell, Ted**
see Weaver, William, 1183
- Cadena, Fernando**
Use of Tailored Bentonite for Selective Removal of Organic Pollutants, 186
- Cadman, John Denys**
Energy from the Amazon, 1291
- Cal, C. W.**
see Cheung, Y. K., 288
- Cain, John**
Domed Renovations, 1257
- Callander, Stephen John**
Flow-Induced Vibrations of Rectangular Cylinders, 627
Force Oscillator Model for Rectangular Cylinder, 344
- Cameron, Gordon Edward**
see Hall, Sandra Katherine, 874

- Cameron, J. T.**
see Brandon, T. L., 448
- Cao, Hong**
see Lee, Vincent W., 389
- Capik, L. Michael**
Diatomaceous Soils: A New Approach, 1191
- Carballada, L. B.**
see Ramamurthy, A. S., 678
- Cardle, James A.**
Measurements of Mixed Transient Flows, 559
- Carey, William P.**
see Mehta, Ashish J., 615
- Carino, Nicholas**
Structure: U.S. Office Building in Moscow, 42
- Carino, Nicholas J.**
see Wright, Richard N., 41
- Carlson, Robert F.**
Cold Regions Engineering Research—Strategic Plan, 139
- Carpinteri, Alberto**
Size Effects on Strength, Toughness and Ductility, 347
- Carr, A. J.**
see Turkington, D. H., 965, 966
- Carr, Athol J.**
see Bhimaraddi, Alavandi, 391
- Carr, Robert I.**
Cost-Estimating Principles, 95
see Reda, Rehab, 90
- Carrasquillo, Ramon L.**
see Poston, Randall W., 19
- Carratelli, Eugenio Pugliese**
Viscous Damping: Time Convolution of the Impulsive Solution, 652
- Carriaga, Carlos C.**
see Tingsanchali, Tawatchai, 1084
- Carter, Edward F.**
Staging of Water Resource Developments, 438
- Caserio, Alan K.**
Space Station Structure Modal Selection Criteria, 23
- CE Editorial Staff**
The Great Quake: On Site Reports, 1287
- Cecilio, Catalino B.**
Private Sector Risk Analysis: Applied to Dam Safety, 765
- Cedolin, Luigi**
see Bazant, Zdeněk P., 956
- Celorie, Jay A.**
Modeling Solute Transport by Centrifugation, 171
- Cerco, Carl F.**
Estimating Estuarine Reaeration Rates, 205
- Chambers, Daniel W.**
Estimating Pit Excavation Volume Using Unequal Intervals, 1011
- Chameau, J. L.**
Knowledge-Based System for Soil Improvement, 118
see Santamarina, J. C., 45
- Chan, H. C.**
Elastic Design Charts of Stiffened Coupled Structural Walls, 801
Stiffened Coupled Shear Walls, 305
see Cheung, Y. K., 288
- Chandran, K. B.**
Finite Element Modeling of Left Ventricle, 375
- Chandrashekhara, K.**
Analysis of Long Cantilever Cylindrical Shell Subjected to Wind Loading, 393
- Chang, Ching S.**
Slip Mechanism-Based Constitutive Model for Granular Soils, 311
Theoretical and Experimental Study of Regular Packings of Granules, 306
- Chang, Chin-Hao**
In-Plane Vibrations of X-Braced Frames, 410
- Chang, Fu-Kuei**
Rebuilding Roebling Delaware Aqueduct Bridge, 865
- Chang, Guey-Shin**
see Chang, Chin-Hao, 410
- Chang, Howard H.**
Mathematical Modeling of Fluvial Sand Delivery, 1144
- Chang, K. C.**
Rate-Dependent Material Model for Structural Steel, 291
see Huang, X. P., 138
see Hwang, J. S., 408, 967
see Shih, T. S., 940
- Chang, Luh-Maan**
Method to Deal with DBE Issues, 248
- Chang, T. J.**
see Delleur, J. W., 684
- Changchit, Chaweng**
CCGP Model for Multiobjective Reservoir Systems, 1113
- Chapman, Thomas W.**
see Stevens, David K., 195
- Chappell, Brian A.**
Rock Bolts and Shear Stiffness in Jointed Rock Masses, 456
- Charalambous, C.**
see Elimam, A. A., 213
- Chase, Donald V.**
see Ormsbee, Lindell E., 1081
- Chatterjee, Arun, ed.**
Goods Transportation in Urban Areas, 1319
- Chatterjee, Arun**
Synthetic Models for Through Trips in Small

AUTHOR INDEX

Chung

- Urban Areas, 1051
- Chaudhry, M. Hanif**
see Dammuller, D. C., 638
see Miller, Sky, 637
- Chauhan, H. S.**
see Khan, G. J., 696
- Chen, Chao L.**
see Juran, Ilan, 470
- Chen, Ching Jen**
see Li, Wei, 425
- Chen, Ching L.**
Analytic Solutions for Tidal Model Testing, 655
- Chen, Frank Hsi-Sheng**
see Logcher, Robert D., 71
- Chen, Wai F.**
see Van Wijk, Adriaan J., 1026
- Chen, Wai-Fah**
Semi-Rigid Steel Beam-to-Column Connections:
Data Base and Modeling, 791
see Duan, Lian, 794, 859
see Sohal, Iqbal S., 885
- Chen, Y. -C.**
see Wen, Y. K., 312, 313
- Chen, Y. Z.**
Buckling Loads of Columns with Varying Cross
Sections, 303
- Chen, Yu-jiong**
Test Embankment Dam of Fracture Grouting, 541
- Chen, Yung Hai**
see Powledge, George R., 612, 613
- Cheng, Franklin Y.**
Recursive Optimization for Seismic Steel Frames,
812
- Cheng, S.**
Stress Distribution and Deformation of Adhesive-
Bonded Laminated Composite Beams, 334
- Cheraghi, Ali**
see Samani, Zohrab, 690
- Chern, Shue-Ming**
see Yang, Yeong-Bin, 968
- Cherry, Sheldon**
see Jinru, Hong, 417
- Cheung, M. S.**
Analysis of Continuous, Haunched Box-Girder
Bridges by Finite Strips, 850
- Cheung, Y. K.**
Exact Method for Static Analysis of Periodic
Structures, 288
see Chen, Y. Z., 303
see Koo, K. K., 404
- Chherng, Yunn-Dar**
see Yang, Yeong-Bin, 314
- Childs, Kenneth M., Jr., ed.**
Ports '89, 1325
- Chin, David A.**
Diagnostic Model of Dispersion in Porous Media,
562
- Chiu, Chao-Lin**
Velocity Distribution in Open Channel Flow, 585
- Cho, Yee**
Putting Waste to Use, 1250
- Choi, Kyung K.**
see Yao, Tse-Min, 929
- Chollet, J. P.**
see Rahuel, J. L., 641
- Chong, Ken P., ed.**
University Programs in Computer-Aided Engi-
neering, Design, and Manufacturing, 1341
- Chopra, Anil K.**
see Fenves, Gregory, 11, 12
see Goyal, Alok, 348, 349, 868, 869
see Hejal, Reem, 372, 835, 836
- Chopra, Anil K., ed.**
see Kircher, Charles A., ed., 1332
- Chou, Yu T.**
Failure of Concrete Pavements in Test Tracks, 1048
- Chow, Phillip Y.**
Structural Engineer's Concept of Lunar Structures,
21
- Chowdhury, Abad N.**
see Gauri, K. Lal, 774
- Christensen, Flemming Thunbo**
Efficiency of Detachable Platforms in the Arctic,
128
- Christian, John T.**
see Tripp, Denise Wilton, 484
- Christiansen, Vance T.**
see Adkins, Dan F., 776
- Christopher, B.**
see Juran, I., 497
- Chu, Shu-Tung**
Hydraulics of Catenary Irrigation Trail Tubes, 669
- Chu, V. H.**
see Babarutsi, S., 602
- Chu, Vincent H.**
Entrainment by Buoyant Jet Between Confined
Walls, 578
- Chu, Yen-hsi**
Breaking Wave Forces on Vertical Walls, 1128
- Chua, K. H.**
see Balendra, T., 270
- Chua, Koon Meng**
Viscoelastic Approach to Modeling Performance of
Buried Pipes, 1032
- Chua, Lai-Heng**
see Paulson, Boyd C., Jr., 121
- Chung, Francis I.**
Network Flow Algorithm Applied to California
Aqueduct Simulation, 1080
- Chung, L. L.**

Experimental Study of Active Control for MDOF

Seismic Structures, 363

see Rodellar, J., 339

Chung, Tae Young

see Vandiver, J. Kim, 1134

Chwang, Allen T.

see Wang, Keh-Han, 359

Clark, Delores, ed.

see Magoon, Orville T., ed., 1304

Clark, Mark M.

see Wiesner, Mark R., 142

Clark, Robert M.

Analysis of Inactivation of Giardia Lamblia by Chlorine, 146

Clausner, James E.

see Truitt, Clifford L., 1169

Cleasby, John L.

see Haarhoff, Johannes, 161

Clemmens, A. J.

Control of Irrigation Canal Networks, 665

Clemmens, Albert J.

see Palmer, Joel D., 725

Clesceri, L. S.

see Back, N. H., 150

Clesceri, N. L.

see Back, N. H., 150

Cleveland, Karen D.

Predicting Reaeration Rates in Texas Streams, 178

Clift, Charles D.

Lateral Buckling in Curtain Wall Systems, 934

Clopper, Paul E.

see Powledge, George R., 612, 613

Clothier, Brent E.

Research Imperatives for Irrigation Science, 689

Clough, G. Wayne

Influence of Cementation on Liquefaction of Sands, 507

Cohen, Edward

see Chang, Fu-Kuei, 865

Cohenca, Dora

Factors Affecting Construction Planning Efforts, 64

Colcord, J. E.

Using Fish-Eye Lens for GPS Site Reconnaissance, 1007

Coleman, Janet A.

see Bowman, Brian L., 1039

Colley, Amon L.

Status of Government Civil Engineers in America, 252

Collins, James

Fundamentals of GPS Baseline and Height Determinations, 996

Collins, S.

see Chandran, K. B., 375

Colpitts, Bruce G.

see Tranquilla, James M., 978

Colton, J. D.

see Gran, J. K., 317

Committee on Employment Conditions of the Professional Practice Division of ASCE

ASCE 1987 Salary Survey, 239

Committee on Ocean Energy of the Waterway, Port, Coastal and Ocean Division of the American Society of Civil Engineers

Compendium of International Ocean Energy Activities, 1309

Converse, Hugh, ed.

see Magoon, Orville T., ed., 1304

Cook, David

Augering Answers, 1289

Cooke, N.

see Turkington, D. H., 965, 966

Cooper, Cortis

see Heideman, John C., 1158

Cooper, James J.

see French, Richard H., 219

Corbu, I., ed.

see Labadie, J. W., ed., 1311

Cording, Edward J.

see Boscardin, Marco D., 446

Corkum, Brent T.

see Ting, John M., 467

Corotis, Ross B.

Future of Civil Engineering Profession and Role of Education, 229

Structural System Reliability Using Linear Programming and Simulation, 931

Costello, Robert L.

Ensuring Your Project Managers' 'Buy-In' to Your Project Management System, 736

Couey, James

see Hinze, Jimmie, 76

Coull, Alex

Analysis of Multioutrigger-Braced Structures, 896

Cowan, M. S.

see Frevert, D. K., 683

Cramer, Calvin O.

see Bohnhoff, David R., 946

Cramer, Steven M.

Load-Distribution Model for Light-Frame Wood Roof Assemblies, 942

see Bohnhoff, David R., 946

Crawford, D.

see Zirschky, J., 218

Craymer, M.

see Quek, See Hean, 981

Crider, Steven S.

Simple Groundwater Laboratory Models, 597

Crisfield, Michael A.

AUTHOR INDEX

Desayi

Analysis of R/C Panels Using Different Concrete Models, 298

Crittenden, John C.

Predicting Gas-Phase Adsorption Equilibria of Volatile Organics and Humidity, 174

Croll, James G. A.

see Yamada, Seishi, 283

Cundy, Terrance W.

Continuous Distributed Model of Storage Dominated Watershed Runoff, 681

Curtis, F. A.

see Vigrass, L. W., 129

Dahl, Finn-Erik

see Heideman, John C., 1158

Dalriva, F. D.

see Kiger, S. A., 893

Dammuller, D. C.

Modeling of Unsteady Flow in Curved Channel, 638

Daniel, David E.

In Situ Hydraulic Conductivity Tests for Compacted Clay, 512

Dargahi-Noubary, G. R.

New Method for Prediction of Extreme Wind Speeds, 315

Darjatmoko, A.

see Berthouex, P. M., 180

Darlow, Mark S.

Instrumentation and Testing of Bridge Rehabilitated with Exodermic Deck, 933

Datta, Tushar K.

see Mashaly, El-Sayed A., 1031

Davis, Christian F.

see Zografos, Konstantinos G., 1058

Davis, Kent

Measuring Design and Construction Quality Costs, 83

Dawson, Bill

High Hopes for Cattails, 1215

Day, Robert W.

Relative Compaction of Fill Having Oversize Particles, 530

Surficial Stability of Compacted Clay Slopes, 478

de Béjar, Luis A.

Seismic Analysis of Multistory Building Systems Using Microcomputers, 101

de Boer, R.

Constitutive Equations for Concrete in Failure State, 362

de Jong, Bartele

Bed Waves Generated by Internal Waves in Alluvial Channels, 596

de Jong, Remy L.

Water Resources of the GCC: International Aspects, 1103

Deason, Jonathan P.

Irrigation-Induced Contamination: How Real a Problem?, 658

Debellefontaine, Hubert

see Foussard, Jean-Noël, 162

Debernardi, Pier Giorgio

Behavior of Concrete Structures in Service, 787

Debo, Thomas N.

see Nelson, Arthur C., 1061

Dedrick, Allen R.

see Palmer, Joel D., 725

DeFraites, Arthur A., Jr.

Fee Vs. Quality, 230

Degenkamp, Gijb

Soil Resistances to Embedded Anchor Chain in Soft Clay, 526

Deierlein, Gregory G.

Beam-Column Moment Connections for Composite Frames: Part 2, 958

see Sheikh, Tauqir M., 957

del Risco, Efrain

see Levi, Enzo, 50

Delleur, J. W.

Simulation Models of Sequences of Dry and Wet Days, 684

see Baffaut, C., 1089

DeLoach, Stephen R.

Continuous Deformation Monitoring with GPS, 985

DeLong, Lewis L.

Mass Conservation: 1-D Open-Channel Flow Equations, 565

DeMalach, Yoel

see Oron, Gideon, 692

Demirbilek, Zeki, ed.

Tension Leg Platform: a State of the Art Review, 1339

Dempsey, Brian A.

see Ray, Bill T., 212

Denney, Richard W., Jr.

Traffic Platoon Dispersion Modeling, 1028

Deodatis, George

Bounds on Response Variability of Stochastic Systems, 420

Simulation of Seismic Ground Motion Using Stochastic Waves, 430

DeOreo, William B.

see Brendecke, Charles M., 1115

Der Kiureghian, Armen

Measures of Structural Safety Under Imperfect States of Knowledge, 853

Dermissis, Vassilios

Geometry of Arrested Thermal Wedges, 1174

Desai, J. P.

Cyclic Response of Concrete Bracing Members, 788

Desayi, Prakash

Markov Chain Model for Cracking Behavior of

- Reinforced Concrete Beams, 914
see Saheb, S. Madina, 943
- DeTar, William R.**
Infiltration Function from Furrow Stream Advance, 712
- Deutsch, William L.**
Determination of Prestress of In Situ Soils Using Acoustic Emissions, 459
- DeVries, Johannes J.**
see Chung, Francis I., 1080
- Dewey, Bruce R., ed.**
see Chong, Ken P., ed., 1341
- Diamond, James T.**
Efficient Land Allocation, 1065
- Diaz, Gustavo E.**
Hydropower Optimization via Sequential Quadratic Programming, 1117
- Diekmann, James E.**
see Ivanoff, Daniel J., 97
- Dillaha, Theo A.**
see Lee, Dowon, 165
- DiLorenzo, Joseph L.**
Water Quality Model for Small Tidal Inlet Systems, 152
- DiMaggio, Frank L.**
see Zhu, Cheng, 350
- Dishman, C. Michael**
Gaining Support for Direct Potable Water Reuse, 233
- Ditlevsen, Ove**
Plastic Reliability Analysis by Directional Simulation, 345
- Doederlein, Ralph C.**
New Roof for an Aging Temporary, 1276
- Dominguez, Jose**
Seismic Response of Strip Footings on Zoned Viscoelastic Soils, 319
- D'Orazio, Timothy B.**
Differential Settlements in Steel Tanks, 2
Distortion of Steel Tanks Due to Settlement of Their Walls, 495
- Doriss, Virginia Kent**
Buying Tomorrow's Water, 1216
- Dow, John O.**
Continuum Models of Space Station Structures, 40
- Dowding, C. H.**
see Labuz, J. F., 382
- Dowdy, Jack**
see Tarquin, Anthony J., 558
- Dowling, Michael J.**
Nonlinear Seismic Analysis of Arch Dams, 410
- Dresenkamp, H. T.**
see de Boer, R., 362
- Dressel, Dirk J.**
The Church on Stilts, 1221
- Driscoll, Charles T.**
see Rice, Dale A., 1099
- Du, Jiaji**
FEM Dynamic Fracture Analysis of Concrete Beams, 396
- Duan, Lian**
Design Interaction Equation for Steel Beam-Columns, 859
Effective Length Factor for Columns in Unbraced Frames, 794
see Sohal, Iqbal S., 885
- Duan, Ning**
see Lansey, Kevin E., 1111
- Dubey, Ashoke Kumar**
see Pillai, N. Narayana, 609
- Duckstein, L.**
Multicriterion Analysis of Hydropower Operation, 445
- Dueker, Kenneth J.**
see Nelson, Arthur C., 1066
- Duggal, Rajesh**
see Nishino, Fumio, 973
- Duncan, James M.**
see D'Orazio, Timothy B., 2, 495
- Dunnivant, Todd W.**
Experimental p - y Model for Submerged Stiff Clay, 451
- Dunnigan, L. P.**
see Sherard, J. L., 498
- Duplancic, Neno**
A Hazardous Data Explosion, 1296
- Durboraw, I. Newton, III**
Surveying With Motorola Eagle GPS Receiver, 999
- Durelli, A. J.**
Parametric Solution of Stresses in Beams, 287
- Durrani, Ahmad J.**
see Zerbe, Hikmat E., 955
- Durst, F.**
see Ganoulis, J., 621
- Dutta, Amit**
see Degenkamp, Gijs, 526
- Dutta, Utpal**
Model for Comparing Performance of Various Transit Maintenance Repair Policies, 1045
- Duval, J. Robert**
see Beck, Norman, 992
- Dyvik, Rune**
Model Tests of Gravity Platforms: Description, 533
see Andersen, Knut H., 534
- Easa, Said M.**
Analytical Solution of Magnetic Declination Problem, 1004
- Direct Land Grading Design of Irrigation Plane Surfaces, 680**
- Free Tension Concept for Precise Taping, 1014**
- General Direct Method for Land Subdivision, 1012**

AUTHOR INDEX

Fabbri

- Resource Leveling in Construction by Optimization, 78
 Three-Point Method for Estimating Cut and Fill Volumes of Land Grading, 695
- Eberhardt, Anthony J., ed.**
 Waterpower '89, 1344
- Ebner, Patrick B.**
 see Abendroth, Robert E., 960
- Ebrahimpour, A.**
 Modeling Dynamic Occupant Loads, 875
- Edgar, Thomas V.**
 Nonisothermal Consolidation in Unsaturated Soil, 522
- Edge, Billy L., ed.**
 Twenty-first Coastal Engineering Conference, 1340
- Edling, R. J.**
 Center-Pivot End Gun Irrigation Cost Analysis, 722
- Effler, Steven W.**
 see Auer, Martin T., 197
 see Rice, Dale A., 1099
- Eheart, J. Wayland**
 see Liehr, Sarah K., 159
- Ekhande, Shantaram G.**
 Stability Functions for Three-Dimensional Beam-Columns, 813
- El Daw, Ahmed K.**
 see Hussein, Ahmed S. A., 732
- Eldin, Neil N.**
 Measurement of Work Progress: Quantitative Technique, 89
- Elgaaly, Mohamed**
 Behavior of Rolled Section Web Under Eccentric Edge Compressive Loads, 880
- Elimam, A. A.**
 Optimum Design of Large Sewer Networks, 213
- Elimelech, Menachem**
 see Adin, Avner, 693
- Elkoush, Abdel F.**
 see Peicheng, Hu, 440, 441
- Ellis, Christopher R.**
 see Johnson, Thomas R., 576
- El-Mabsout, Mounir**
 see Mau, S. T., 262
- Elsbury, Bill R.**
 Building a Better Landfill Liner, 1209
- El-Tahan, W. W.**
 Structural Analysis of Bimodular Materials, 322
- Elton, David J., ed.**
 Resilient Moduli of Soils: Laboratory Conditions, 1329
- Elton, David J.**
 see Shoemaker, W. Lee, 242
- Elwi, A. E.**
 see Link, R. A., 365
- Elwi, Alaa E.**
- Finite Element Model for Curved Embedded Reinforcement, 308
 see Roman, Vasile G., 422
- Elwood, John R.**
 Project Peer Review for Deer Island Secondary Treatment Planning, 247
- Embree, Edward**
 see Martin, Jonathan W., 780
- Endersbee, Lance**
 Global Changes and New Challenges for Civil Engineers, 226
- English, Marshall**
 Effects of Deficit Irrigation and Irrigation Frequency on Wheat Yields, 672
- Epstein, Marcelo**
 see Huttelmaier, H. Peter, 282
- Eren, Kamil**
 Effect of Orbital A Priori Information on Baseline Determinations, 989
- Ergin, Aygen**
 Rubble-Mound Breakwaters with S-Shape Design, 1160
- Erickson, Jim**
 Meeting the Quality Management Issue on Highway Construction, 234
- Erken, Ayfer**
 see Ansal, Atilla M., 500
- Erkin, Mehmet**
 see Tavakoli, Amir, 79
- Escalera, C. R.**
 see Kuroda, M., 210
- Eschenbach, Ted G.**
 Alaska's Infrastructure and Limits to Growth, 127
 see Wyrick, David A., 73
- Escobar, Guillermo**
 see Karaa, Fadi A., 767
- Estenssoro, Luis F.**
 Two Roof Failures Due to Water Ponding and Related Code Requirements, 53
- Esterbrooks, Robert C.**
 Fees Versus Quality, 244
- Esteva, Luis**
 Seismic Failure Rates of Multistory Frames, 802
- Estey, H. P.**
 see Miller, L. L., 444
- Ettema, Robert**
 see Jain, Subhash C., 623
 see Nakato, Tatsuaki, 133
- Eubanks, R. A.**
 see Zureick, A. H., 10
- Everett, Jess W.**
 Variable Injection Active-Pulse Air Classification, 164
- Fabbri, Paolo**
 Coastlines of Italy, 1306

- Fadous, George M.**
see Avent, R. Richard, 884
- Fahlbusch, Friedrich E.**
see Matsumoto, Junji, 1082
- Fairweather, Virginia**
Hydro on Hold, 1248
- Falk, Robert H.**
Finite Element Modeling of Wood Diaphragms, 817
- Fan, Hung-Taw**
see Yang, Yeong-Bin, 968
- Fan, Q. S.**
Interaction of Buckling Modes of Panels with Symmetric Cross Section, 419
- Faravelli, Lucia**
Response-Surface Approach for Reliability Analysis, 433
- Farghaly, Hani A.**
see Baddour, Raouf E., 600
- Farid, Foad**
Required Return on Investments in Construction, 66
Sensitivity Analysis of Construction Contract Prices Using Spreadsheets, 117
- Fasol, K. H.**
see Pessen, D., 1124
- Fellenius, Bengt H.**
Dynamic and Static Testing in Soil Exhibiting Set-Up, 501
- Felsen, Michael D.**
Mediation that Worked: Role of OSHA in L'Ambiance Plaza Settlement, 55
- Fenske, S. M.**
Business Planning for New Engineering Consulting Firms, 742
Establishing, Operating, and Controlling an Engineering Consulting Firm, 235
- Fenske, T. E.**
see Fenske, S. M., 235, 742
- Fenves, Gregory**
Simplified Earthquake Analysis of Concrete Gravity Dams: Combined Hydrodynamic and Foundation Interaction Effects, 12
Simplified Earthquake Analysis of Concrete Gravity Dams: Separate Hydrodynamic and Foundation Interaction Effects, 11
- Fenves, Steven J.**
see Garrett, James H., 870
- Ferreira, Antonio**
see Arndt, Roger E. A., 626
- Fertis, Demeter G.**
Equivalent Systems for Variable Thickness Plates, 405
Pseudolinear and Equivalent Systems for Large Deflections of Members, 414
- Fiedler, Bill**
Dams Reborn, 1214
- Fillipović, Vladeta**
DYN² Method for Optimal Control of Water Flow in Open Channels, 728
- Finlayson, Donald J.**
What a Layperson Needs to Know About Water Rights, 691
- Finlayson, Donald J., ed.**
see Johnson, A. I., ed., 1298
- Finney, Brad A.**
see Willis, Robert, 1109
- Finno, Richard J.**
Observed Performance of a Deep Excavation in Clay, 504
- Finno, Richard J., ed.**
Predicted and Observed Axial Behavior of Piles: Results of a Pile Prediction Symposium, 1327
- Finno, Richard J.**
Saturated Clay Response During Braced Cut Construction, 505
- Fiore, John**
Electricity From Air, 1239
- Firmage, D. Allan**
Management/Employee Ethics in Engineering Offices, 228
- Fisher, D.**
see Chandran, K. B., 375
- Fisher, Gordon P., ed.**
see Chatterjee, Arun, ed., 1319
- Fitzgerald, Robert W.**
Cracking the Fire Code, 1218
- Flathau, William J.**
see Krauthammer, Theodor, 833
- Florence, A. L.**
see Gran, J. K., 317
- Flynn, Lawrence E.**
Aqueduct and Reservoir Capacities for Distribution Systems, 1106
- Foadian, Hossein**
see Wolde-Tinsae, Amde M., 388
- Fogg, Jeth A.**
see Baus, Ronald L., 1052
- Folse, Michael D.**
Reliability Analysis for Laterally Loaded Piling, 846
- Folz, Bryan**
Reliability-Based Design of Wood Structural Systems, 886
- Fong, Soon S.**
see Keller, Robert J., 667
- Fontaine, Thomas A.**
Estimating Probabilities of Extreme Rainfalls, 643
- Fontane, Darrell G.**
Implementation Strategies for Salinity Projects, 1114
see Diaz, Gustavo E., 1117
- Ford, David T.**

Floodplain-Management Plan Enumeration, 1101

Forster, James F.

The Long Arm of Liability, 1265

Foschi, Ricardo O.

see Folz, Bryan, 886

Fotopoulou, M.

see Hatzikonstantinou, E., 471

Fotopoulou, Martha

Rocking Damping of Arbitrarily-Shaped Embedded Foundations, 472

Fourie, Andy B.

Laboratory Evaluation of Lateral Swelling Pressure, 529

Foussard, Jean-Noël

Efficient Elimination of Organic Liquid Wastes: Wet Air Oxidation, 162

Foutch, Douglas A.

Seismic Behavior of Eccentrically Braced Steel Building, 898

Fox, Gerard F.

Expressway Centerpiece, 1194

Foy, Christiane

see Banthia, Nemkumar, 775

Fragaszy, Richard J.

see Lawton, Evert C., 515

Franchi, Alberto

A Self-Adaptive Model for Structural Softening of Brittle Materials, 358

Frangopol, Dan M.

Material Behavior and Optimum Design of Structural Systems, 849

Franke, O. Lehn

see Reilly, Thomas E., 566

Frauenhoffer, John A.

Roof Collapse, Taxi Cab Company Garage, Champaign, Illinois, 49

Frederiksen, Harald D.

see Le Moigne, Guy J. -M., 706

Fredsoe, Jørgen

see Sumer, B. Mutlu, 1155

French, Catherine Wolfgram

Connections Between Precast Elements—Failure Outside Connection Region, 805

Connections Between Precast Elements—Failure Within Connection Region, 976

Contribution of R/C Floor Slabs in Resisting Lateral Loads, 785

see Ammerman, Olga Velez, 863

French, Richard H.

Daily Average Value of Un-ionized Ammonia from Field Measurements, 219

Effect of Length of Record on Estimates of Annual Precipitation in Nevada, 579

Performance of In Situ Microcosms Compared to Actual Reservoir Behavior, 192

Frevert, D. K.

Use of Stochastic Hydrology in Reservoir Opera-

tion, 683

Frishman, Steve

The Challenge of Yucca Mountain, 1205

Froese, Thomas M.

see Paulson, Boyd C., Jr., 121

Fu, Chung C.

see Schelling, D., 915

Fujii, Fumio

Scheme for Elasticas with Snap-Back and Looping, 398

Fukuta, Toshibumi

Seismic Performance of Steel Frames with Inverted V Braces, 907

Fwa, T. F.

Bus-Ride Panel Rating of Pavement Serviceability, 1027

Gaiotti, Regina

P-Delta Analysis of Building Structures, 830

Galambos, Theodore V.

see Kuwamura, Hitoshi, 873

Gallaccio, Joseph

see Dressel, Dirk J., 1221

Gallier, W. Thomas

see Putnam, Stephen P., 1198

Gan, K. T.

see Fwa, T. F., 1027

Ganoulis, J.

Laser Measurements and Computations of Viscous Flows Through Cylinders, 621

see Babarutsi, S., 602

Gantes, Charis J.

Impact of Earthquakes on Cantilever Retaining Walls, 939

Gantzer, Charles J.

Inhibitory Substrate Utilization by Steady-State Biofilms, 158

Garber, E. Bruce

see Zuras, C. Milton, 1187

Garber, George

Post-Tensioned Transportation, 1272

Garrett, James H.

Knowledge-Based Standard-Independent Member Design, 870

Gasparini, D. A.

Dynamic and Static Behavior of Cable Dome Model, 807

Gates, Timothy K.

Irrigation and Drainage Strategies in Salinity-Affected Regions, 679

Stochastic Approximation Applied to Optimal Irrigation and Drainage Planning, 694

Gauri, K. Lal

Rate of Decay of Marble in Laboratory and Outdoor Exposure, 774

see Kulshreshtha, Niraj P., 773

Gayle, B. P.

- Biological Denitrification of Water, 196
- Gazetas, G.**
see Hatzikonstantinou, E., 471
- Gazetas, George**
see Fotopoulou, Martha, 472
- Gebler, Steven H.**
see Russell, Henry G., 1282
- Geistants, George A.**
see Eschenbach, Ted G., 127
- Genna, Francesco**
see Franchi, Alberto, 358
- Georgakakos, Konstantine P.**
On Least-Cost Design of Aqueduct Systems, 1102
- Gerber, Edward**
see Hall, Philip, 1207
- Gerhold, Carl H.**
Active Control of Flexural Vibrations in Beams, 33
- Germaine, John T.**
see Malek, Aziz M., 481
- Ghalayini, S. A.**
Nonlinear Wave Forces on Vertical Cylinders of Arbitrary Cross Section, 1173
- Ghali, Amin**
see Sirosh, Saaananaan N., 824
- Ghanem, Roger**
see Spanos, P. D., 326
- Ghani, M. A.**
Gravity Irrigation Management in Bangladesh, 705
- Gharpuray, Vasant**
Simplified Second-Order Elastic-Plastic Analysis of Frames, 104
- Ghobrial, F. H.**
see Elimam, A. A., 213
- Ghussu, G.**
see Saiidi, M., 809
- Gianelli, William R.**
Panama Canal: Its Past and Its Future, 249
- Giglio, M. Joseph**
Financing Urban Transportation, 1186
- Gilbert, R. Ian**
Time-Dependent Analysis of Composite Steel-Concrete Sections, 947
- Gilbert, Robert B.**
see Tang, Wilson H., 269
- Gill, Mohammed Akram**
Response of Muskingum Equation to Step Input, 714
- Gilley, James R.**
see Martin, Derrel L., 663
- Giridhar, D. P.**
see Murthy, K. Keshava, 733
- Globig, Herbert**
see Fox, Gerard F., 1194
- Goad, Clyde C.**
Kinematic Survey of Clinton Lake Dam, 983
- Godoy, L. A.**
see Prato, C. A., 977
- Gochring, Robert**
Stabilizing a 'Mann'-Sized Sinkhole, 1290
- Goel, Arun**
see Pillai, N. Narayana, 609
- Goel, Subhash C.**
Analytical Modeling of Phase 2 Steel Structure, 903
see Tang, Xiaodong, 904
- Goldman, Ariel**
see Bentur, Arnon, 772
- Golding, Barry T.**
Capped Water Intakes in a Stratified Crossflow, 563
- Golley, Bruce W.**
see Petrolito, Joseph, 335
- Golob, Thomas F.**
Safety of High-Occupancy Vehicle Lanes Without Physical Separation, 1054
- Gómez, M.**
see Rodellar, J., 710
- Goodings, D. J.**
Reinforced Earth and Adjacent Soils: Centrifuge Modeling Study, 503
- Goodspeed, C. H.**
see Behr, R. A., 845
- Goodspeed, Charles H.**
see Behr, Richard A., 814
- Gordon, J. A.**
see Brown, R. T., 220
- Gordon, J. L.**
Submergence Factors for Hydraulic Turbines, 442
- Gordon, John A.**
Treatment of Manganese from Mining Seep Using Packed Columns, 163
- Gordon, Mark E.**
Hydraulic Conductivity of Three Landfill Clay Liners, 510
- Gordon, R. Lee**
Acoustic Measurement of River Discharge, 603
- Gould, P. L.**
Repair and Completion of Damaged Cooling Tower, 819
- Gould, Phillip L.**
see Liu, Henry, 36
- Goulter, I. C.**
Analysis of Water Distribution Pipe Failure Types in Winnipeg, Canada, 1022
- Goyal, Alok**
Earthquake Response Spectrum Analysis of Intake-Outlet Towers, 349
- Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Frequency Response Functions, 868**
- Hydrodynamic and Foundation Interaction Effects in Dynamics of Intake Towers: Earthquake**

- Responses, 869
- Simplified Evaluation of Added Hydrodynamic Mass for Intake Towers, 348
- Grace, Nabil F.
see Kennedy, John B., 810
- Gran, J. K.
Dynamic Triaxial Tests of High-Strength Concrete, 317
- Grasso, Domenic
Mathematical Interpretation of Aqueous-Phase Ozone Decomposition Rates, 173
- Gravesen, Helge
see Sumer, B. Mutlu, 1155
- Grayman, Walter M.
see Hobbs, Benjamin F., 1070
- Greco, Carlo
see Ting, John M., 467
- Greimann, Lowell F.
see Abendroth, Robert E., 960
- Grice, William A.
see Petrolito, Joseph, 335
- Grierson, Donald Edward
see Hall, Sandra Katherine, 874
- Griffiths, George A.
Form Resistance in Gravel Channels with Mobile Beds, 570
- Grigg, Neil S.
Regionalization in Water Supply Industry: Status and Needs, 1094
- Grimm, Clayford T.
Shelf Angles for Masonry Veneer, 815
- Grismer, Mark E.
see Gates, Timothy K., 679, 694
- Gross, James G.
Brick Masonry: U.S. Office Building in Moscow, 43
see Carino, Nicholas, 42
see Wright, Richard N., 41
- Gross, John L.
Ashland Tank Collapse Investigation, 51
- Groves, G. Raymond
see Squires, Rodney C., 662
- Grubert, John P.
Interfacial Mixing in Stratified Channel Flows, 601
Interfacial Stability in Stratified Channel Flows, 619
- Guedelhoefer, O. C.
see Gould, P. L., 819
- Guenther, Paul W.
see Puckett, Jay A., 116
- Gunaratnam, David J.
see Oppenheim, Irving J., 837
- Günbak, Riza A.
see Ergin, Ayşen, 1160
- Gunnerson, Charles G., ed.
Post-Audits of Environmental Programs and Pro-

- jects, 1326
- Gupta, Ajaya K.
Post-Cracking Behavior of Membrane Reinforced Concrete Elements Including Tension-Stiffening, 842
- Unified Approach to Modeling Post-Cracking Membrane Behavior of Reinforced Concrete, 843
- Gurfinkel, German
Brittle Fracture and Collapse of Large Grain-Storage Tank, 52
Collapse and Repair of Tall Concrete Silos with Suspended Steel Hopper, 59
Restoring an Impaired Concrete Silo, 46
- Guzman, A. G.
Simulating Effect of Channel Changes on Stream Infiltration, 649
- Haarhoff, Johannes
Direct Filtration of *Chlorella* with Cationic Polymer, 161
- Haas, Charles N.
Error in Variables Parameter Estimation, 156
- Haasbeek, John F.
see Todd, David A., 179
- Hafner, Michael
see French, Catherine Wolfram, 976
- Hagen, Olstein
see Heideman, John C., 1158
- Hager, Willi H.
Hydraulic Jump in U-Shaped Channel, 590
Supercritical Flow in Channel Junctions, 586
Transitional Flow in Channel Junctions, 564
see Bremen, Roger, 587
- Hagerty, D. J.
Evaluation of Navigation Dam Effects on Riverbanks, 1149
Ohio River Bank Erosion—Traffic Effects, 1150
- Hagerty, D. Joseph
see Weigel, Terence A., 106
- Hagerty, M. J.
see Hagerty, D. J., 1150
- Halmes, Yacov Y., ed.
Risk Analysis and Management of Natural and Man-Made Hazards, 1330
- Halmes, Yacov Y.
see Karlsson, Per-Ola, 1090
- Hainsworth, Graham D.
see Bargiela, Andrzej, 1085
- Haith, Douglas A.
Screening of Groundwater Contaminants by Travel-Time Distributions, 170
- Haldar, Achintya
see Mahadevan, Sankaran, 881
- Hall, Herschel E.
see Zabalski, Ronald, 1226
- Hall, John F.
see Burridge, Paul B., 499

- see Dowling, Michael J., 310
- Hall, Philip**
The Saga of Senate Bill 2067, 1207
- Hall, R. L.**
see Kiger, S. A., 893
- Hall, Sandra Katherine**
Least-Weight Design of Steel Frameworks Accounting for P - Δ Effects, 874
- Hall, Stephen K.**
Agricultural Drainage Water—How Should it be Regulated in California?, 657
- Hall, Thomas A., ed.**
Engineering 21st Century Highways, 1315
- Hall, W. J.**
see McCabe, S. L., 916
- Halliwell, A. Roy**
see Bree, Jim, 279
- Halpin, Daniel W.**
see Kangari, Roozbeh, 67
- Ham, Robert K.**
see Barlaz, Morton A., 207
- Hamidi, Ramin**
see Herrmann, Leonard R., 930
- Han, K. J.**
Effect of External Pressure on Strength of Short Tubular Members, 9
- Han, Yingcai**
Coupled Vibration of Embedded Foundation, 513
- Hanoor, Ariel**
Modification of Behavior of Double-Layer Grids: Overview, 847
- Hancher, Donn E.**
see Jahren, Charles T., 61
see Kakoto, Takao, 92
see Smith, Gary R., 96
- Hancock, G. J.**
see Rasmussen, K. J. R., 832
- Hand, David W.**
see Crittenden, John C., 174
- Handa, S. C.**
see Saran, Swami, 477
- Hanna, Shaddy Y.**
Influence of Tension, Weight and Hydrostatic Pressure on TLP Tendons, 1135
- Hansen, Karen Lee**
Technology and Strategic Management in Construction, 740
- Hansen, Mark**
Hubbing and Airline Costs, 1053
- Hansmire, William H.**
Field Performance of Structural Slurry Wall, 454
- Hanson, Clayton L.**
Prediction of Class A Pan Evaporation in Southwest Idaho, 671
- Hanson, Robert D.**
see Mahin, Stephen A., 913
see Wu, Jianping, 871
- Hantush, Mohamed M. S.**
Chance-Constrained Model for Management of Stream-Aquifer System, 1088
- Hao, Oliver J.**
see Piluk, Richard J., 184
- Hardcastle, James H.**
see Lawton, Evert C., 515
- Hardin, Bobby O.**
1D Strain in Normally Consolidated Cohesive Soils, 485
Elasticity of Particulate Materials, 490
Low-Stress Dilation Test, 489
- Harding, S. J.**
see Banon, H., 920
- Hargreaves, George H.**
Accuracy of Estimated Reference Crop Evapotranspiration, 730
Modeling Yields from Rainfall and Supplemental Irrigation, 677
- Harichandran, Ronald S.**
Eigenproperties of Nonclassically Damped MDOF Composite Systems, 357
see Zhang, Yan, 356
- Harik, Issam E.**
Analytical Solution to Free Vibration of Sector Plates, 429
- Harmon, Thomas G.**
Shear Strength of Reinforced Concrete Plates and Shells Determined by Finite Element Analysis Using Layered Elements, 854
- Harris, Steven C., ed.**
Water Resources Planning and Management, 1342
- Harrop-Williams, Kingsley**
Arch in Soil Arching, 469
Random Nature of Soil Porosity and Related Properties, 332
- Harrop-Williams, Kingsley O.**
Geostatic Wall Pressures, 519
- Hart, E.**
see Warrick, A. W., 708
- Hart, Marion**
People Movers Move Downtown, 1192
- Hart, Marion H.**
Shopping for Better Project Management, 1175
- Hartono, Wibisono**
see Nishino, Fumio, 397
- Hårvik, Linda**
see Andersen, Knut H., 534
- Hasebe, Kaoru**
Application of Orthotropic Failure Criterion to Wood, 316
- Hasebe, Norio**
A Crack Initiating from Rhombic Rigid Inclusion, 431

- Frictional Punch and Crack in Plane Elasticity, 333
- Hasegawa, Akio**
Elastic and Plastic Designs for Maximum Load, 866
- Hasegawa, Kazuyoshi**
Universal Bank Erosion Coefficient for Meandering Rivers, 593
- Hasegawa, Takashi**
see Amir, Hossain M., 822
- Hasnat, Abul**
see Wafa, Faisal F., 949
- Hassan, A. A.**
see Kholeif, I. A., 383
- Hatch, Ronald R.**
Strategic Planning Tool for GPS Surveys, 994
- Hatem, David J.**
Impact of Professional Practice Standards on Liability of Engineers, 754
- Hatzikonstantinou, E.**
Rocking Stiffness of Arbitrarily-Shaped Embedded Foundations, 471
- Havis, Robert N.**
Approximate Dynamic Lake Phosphorus Budget Models, 190
- Haviv, Eitan**
see Jaegermann, Chanoch, 771
- Hawkins, E. F.**
see Abt, S. R., 443
- Hawkins, Neil M.**
see Du, Jiaji, 396
- Hawkins, Richard H.**
see Cundy, Terrance W., 681
- Hayashi, Y.**
see Baba, S., 421
- Hayter, Earl J.**
see Mehta, Ashish J., 614, 615
- Heaney, James P.**
see Knowles, Leel, 108
- Heideman, John C.**
Joint Probability of Extreme Waves and Currents on Norwegian Shelf, 1158
- Heien, Dag**
see Andersen, Knut H., 534
- Hein, Günter W.**
Integrated Processing of GPS and Gravity Data, 979
- Heinrich, S. M.**
Stress Interference in a Transversely Isotropic Body Under Axisymmetric Loading, 297
- Heinz, A. Rooney**
see Bailard, A. James, 1180
- Hejal, Reem**
Earthquake Response of Torsionally Coupled, Frame Buildings, 835
Lateral-Torsional Coupling in Earthquake Response of Frame Buildings, 836
- Response Spectrum Analysis of Class of Torsionally-Coupled Buildings, 372
- Helliotis, Francis D.**
Water Storage Capacity of Wetland Used for Wastewater Treatment, 191
- Heltzel, Samuel B.**
see Mehta, Ashish J., 615
- Hendrickson, Chris**
Unified Activity Network Model, 114
see Rossi, Thomas F., 1063
- Hendrickson, Erik M.**
see Carino, Nicholas, 42
- Henry, R. M.**
see Behr, R. A., 845
- Hensey, Melville**
see Roenker, Gerald, 739
- Herrmann, Leonard R.**
Analytical Parameter Study for Class of Elastomeric Bearings, 930
- Herz, Raimund**
see Axhausen, Kay W., 1037
- Herzog, Max A. M.**
Design Formulas for Unstiffened and Stiffened Plate Girders in Shear, 950
Spatial Action of Straight Gravity Dams in Narrow Valleys, 826
- Heuer, Kerry L.**
see Barr, Douglas W., 1256
- Hiatt, Wright**
Land Use and Urban Planning in Paradise: Waikiki, 1060
- Hildebrandt, Randy**
see Rodgers, Audrey P., 1193
- Hill, Christopher D.**
Post-Buckling Analysis of Steel Space Trusses, 839
- Hill, R. W.**
see Ghani, M. A., 705
- Hill, Robert W.**
see Boman, Brian J., 709
- Hillier, M. Anthony**
Managing a Megaproject, 1225
- Hinze, Jimmie**
Comparison of Labor Agreements, 65
Weather in Construction Contracts, 76
- Hirakawa, Jimmy**
see Hinze, Jimmie, 65
- Hjelmfelt, Allen T., Jr.**
Chaotic Behavior of Particle on Vibrating Plate, 352
- Ho, Duen**
Extreme Thermal Loadings in Highway Bridges, 887
- Hobbs, B. F.**
see Duckstein, L., 445
- Hobbs, Benjamin F.**
Impact Evaluation Procedures: Theory. Practice.

- and Needs, 1070
- Hochstein, Anatoly B.**
Influence of Vessel Movements on Stability of Restricted Channels, 1153
- Hoff, John C.**
see Clark, Robert M., 146
- Holler, Jeffrey Dee**
Stormwater Detention Basin Nutrient Removal Efficiency, 1075
- Holley, Edward R.**
see Bales, Jerad D., 1152
- Holly, F. M.**
see Rahuel, J. L., 641
- Holmes, Bayard S.**
see Kirkpatrick, Steven W., 328
- Holweg, J.**
see Ganoulis, J., 621
- Hong, Won Pyo**
Strain Increment and Stress Directions in Torsion Shear Tests, 524
- Honjo, Yusuke**
Improved Filter Criterion for Cohesionless Soils, 450
- Hopfinger, Bernard**
see Koiv, Vello, 1268
- Horn, Dennis R.**
Characteristics and Spatial Variability of Droughts in Idaho, 666
- Hothem, Larry D.**
see Soler, Tomás, 1013
see Zilkoski, David B., 1000
- Houghtalen, Robert J.**
Improving Water Delivery System Operation Using Training Simulators, 1110
- Howard, H. C.**
Computer-Integration: Reducing Fragmentation in AEC Industry, 102
- Hoyt, Jack W.**
Hydraulic Jump as "Mixing Layer", 647
- Hribar, John P.**
see Miller, Robert D., 221
- Hromadka, T. V., II**
Checking Flood Frequency Curves Using Rainfall Data, 583
- Hrudey, Terry M.**
see Elwi, Alaa E., 308
- Hryciw, Roman D.**
Ray-Path Curvature in Shallow Seismic Investigations, 516
- Hsieh, Hsin-Neng**
see Raghu, Dorairaja, 48
- Hsu, John R. C.**
Applications of Headland Control, 1143
Model Test Results of Scour Along Breakwaters, 1129
Static Equilibrium Bays: New Relationships, 1142
- see Silvester, Richard, 1145
- Hu, Hsuan-Teh**
Constitutive Modeling of Concrete by Using Nonassociated Plasticity, 783
- Huang, Jerry Y. C.**
Effect of Solids Property on Rates of Solids Dislodgment, 141
- Huang, Ju-Chang**
Sludge Digestion by Anaerobic Fluidized Beds: I—Lab Performance Data, 211
see Ray, Bill T., 212
- Huang, Min-Chih**
Improved Algorithm for Stream Function Wave Theory, 1133
- Huang, Po-Shu**
see DiLorenzo, Joseph L., 152
- Huang, Shiyun**
see Wan, Yonghua, 1095
- Huang, X. P.**
Analytical Models of Local Concrete-Steel Bond at Low Temperature, 138
- Huang, Yao-Jiang**
see Huang, Ju-Chang, 211
- Hudak, Paul F.**
see Loaiciga, Hugo A., 1116
- Hudec, Peter P.**
Durability of Rock as Function of Grain Size, Pore Size, and Rate of Capillary Absorption of Water, 768
- Huebner, Paul M.**
see Gordon, Mark E., 510
- Hughes, P. J.**
Pipe Manipulator Enhancements for Increased Automation, 85
- Humenik, F. J.**
see Ritter, W. F., 719
- Hussein, Ahmed S. A.**
Evapotranspiration in Sudan Gezira Irrigation Scheme, 732
- Huttelmaier, H. Peter**
Multilayered Finite Element Formulation for Vibration and Stability Analysis of Plates, 282
- Huyer, Stephen A.**
see Dow, John O., 40
- Hwang, Guann-Jiun**
see Tingsanchali, Tawatchai, 620
- Hwang, J. S.**
Modified Frequency-Domain Data Processing, 408
Shaking Table Tests of Pinned-Based Steel Gable Frame, 967
- Hwang, Ralph B.**
see Sloat, Mark S., 1069
- Hydropower Committee, Energy Division, American Society of Civil Engineers**
Civil Engineering Guidelines for Planning and Designing Hydroelectric Developments, 1303

IAHR Working Group on Wave Generation and Analysis

List of Sea-State Parameters, 1172

Ibbs, William

see Abu-Hijleh, Samer F., 87

Iffland, Jerome S. B., ed.

Steel Structures, 1334

Igarashi, Katsuya

see Bertero, Vitelmo V., 899

Igusa, Takeru

Characteristics of Response to Nonstationary White Noise: Theory, 380

Characteristics of Response to Nonstationary White Noise: Applications, 381

Igwemezie, Jude O.

Impact Load Distribution in Concrete Bridge Ties, 816

Illangasekare, Tissa

see Amadei, Bernard, 436, 437

Inada, Yoshinori

Storage of Heated Water in Underground Openings, 480

Ingraffea, A. R.

see Linsbauer, H. N., 882, 883

In-na, Nophadol

see Nguyen, Van-Thanh-Van, 591

Ioannou, Photios

Dynamic Probabilistic Decision Processes, 74

Ioannou, Photios G.

Evaluation of Subsurface Exploration Programs, 80
Geologic Prediction Model for Tunneling, 7

Iranpour, Reza

Methodology for Optimal Design of a Parking Lot, 1025

Ircha, Michael C.

Restructuring Organizations: Alternatives and Costs, 746

Irion, Karen S.

Can Civil Engineers Make the Difference by Involvement in the Political Process?, 261

Irshad, Mohammad

Segmental Tunnel Lining Meets 'Buy American', 1269

Ismael, Nabil F.

Field Tests on Bored Piles Subject to Axial and Oblique Pull, 536

Skin Friction of Driven Piles in Calcareous Sands, 453

Upgrading Footings in Sand with Bored Piles, 546

Israeli, Israel

see Pleban, Shlomo, 701

Istok, Jonathan D.

see Celorie, Jay A., 171

Itakura, Tadaoki

see Shimizu, Yasuyuki, 572

Itani, Rafik Y.

see Falk, Robert H., 817

Ito, Yoshiro

see Hasebe, Norio, 431

Ivanoff, Daniel J.

Project-Labor Agreements in Construction Industry, 97

Ivor-Smith, Douglas

Channel Tunnel, Texas Style, 1286

Iwabuchi, Jotaro

see Clough, G. Wayne, 507

Iwamoto, Hiroaki

see Reed, Brian E., 193

Jacangelo, Joseph G.

Membranes in Water Treatment, 1220

Jadaan, Khair S.

Accuracy of Turning Flow Estimates at Road Junctions, 1044

Jaegermann, Chanoch

Blistering of Membranes Over Foam-Concrete Roofs, 771

Jafroudi, Siamak

see Rada, Gonzalo R., 1041

Jagdish, K. S.

see Raghu Prasad, B. K., 373

Jahren, Charles T.

Evaluation of New Concepts for Cellular Structure Construction, 61

Jain, A. K.

see Desai, J. P., 788

Jain, Rakesh K.

Static Buckling of Orthotropic Spherical Shells on Elastic Foundations, 424

Jain, Subhash C.

Guide for Estimating Riverbed Degradation, 571
Minimization of Frazil-Ice Production by River-Flow Regulation, 623

James, A.

see Bicudo, J. R., 200

James, Wesley P.

see Pridal, Daniel B., 1079

Jang, Sangsik

see Polensek, Anton, 399

Janis, Kay V.

Superskyscraper, 1201

Jayaraman, R.

see Rao, A. S. Prasada, 856

Jayashankar, Viswanath

see French, Catherine Wolfram, 976

Jayawardena, Amithirigala W.

Time Series Analysis of Water Quality Data in Pearl River, China, 176

Jenkins, A. Scott

see Bailard, A. James, 1180

Jester, Guy E.

Curriculum for Future Civil Engineers: Practi-

- tioner's Viewpoint, 250
- Jeyapalan, Jey K.**
Analysis and Design of RPM and Other Composite Underground Pipelines, 1030
- Jiabo, Hu**
Buckling of Smooth Linings of Pressure Shafts and Tunnels, 435
- Jianbo, Cai**
see Bofang, Zhu, 91
- Jiang, Lin**
Viscous Damping of Solitary Waves Over Fluid-Mud Seabeds, 1146
- Jiang, T.**
see Cheng, S., 334
- Jiang, Y.**
see Saiidi, M., 809
- Jin, D.**
see Wang, C. M., 330
- Jinru, Hong**
Influence Coefficients for Dynamic Response of Foundations, 417
- Jirsa, James O.**
see Deierlein, Gregory G., 958
see Sheikh, Tauqir M., 957
- Jo, Chul H.**
see Machemehl, Jerry L., 136, 137
- Johannesson, Helgi**
Secondary Flow in Mildly Sinuous Channel, 567
Velocity Redistribution in Meandering Rivers, 611
- John, Reji**
Fracture Mechanics Analysis of High-Strength Concrete, 782
see Alvarado, Manuel A., 285
- Johns, Gerald E.**
Regulation of Agricultural Drainage to the San Joaquin River, 660
- Johnson, A. I., ed.**
Artificial Recharge of Ground Water, 1298
- Johnson, L. E., ed.**
see Labadie, J. W., ed., 1311
- Johnson, Peggy A.**
Slit Dam Design for Debris Flow Mitigation, 625
- Johnson, R. A.**
CO Modeling in Alaska, 140
- Johnson, T. L.**
see Abt, S. R., 443
- Johnson, Thomas R.**
Negatively Buoyant Flow in Diverging Channel. IV: Entrainment and Dilution, 576
see Stefan, Heinz G., 575
- Johnston, David W.**
Formwork Pressures in Tall and Thick Concrete Walls, 88
- Johnston, Ian W.**
Shear Behavior of Regular Triangular Concrete/Rock Joints—Analysis, 486
- see Lam, Thomas S. K., 487
- Johnston, William R.**
see Hall, Stephen K., 657
see Squires, Rodney C., 662
- Jones, Nicholas P.**
see Shenton, Harry W., III, 123
- Jong, Kwo-Yih**
see Rencis, Joseph J., 386
- Ju, J. W.**
Energy-Based Coupled Elastoplastic Damage Models at Finite Strains, 418
- Ju, Jiann-Wen**
Continuum Damage of Cement Paste and Mortar as Affected by Porosity and Sand Concentration, 268
- Ju, Rong-Shyang**
Freeway Surveillance and Control System Using Simulation Model, 1043
- Juang, D. S.**
see Cheng, Franklin Y., 812
- Julien, Pierre Y.**
Discussion of: Simple Model of Sediment - Laden Flows, 6
see Williams, David T., 644
- Juran, I.**
Laboratory Model Study on Geosynthetic Reinforced Soil Retaining Walls, 497
- Juran, Ilan**
Interpretation Procedure for Pressuremeter Tests in Sand, 538
Strain Compatibility Design Method for Reinforced Earth Walls with Metallic Reinforcements, 470
- Justesen, Peter**
Hydrodynamic Forces on Large Cylinders in Oscillatory Flow, 1156
- Kadar, Istvan**
Analyzing in 3D, 1196
- Kagan, Harvey A.**
Practical Quality-Controlled Construction, 54
- Kakoto, Takao**
Comparison of U.S. and Japanese Practices in Public Construction, 92
- Kalkani, E. C.**
Polynomial Regression to Forecast Earth Dam Piezometer Levels, 698
- Kallivokas, Dimitris**
see Gantes, Charis J., 939
- Kaminosono, Takashi**
see Yamazaki, Yutaka, 912
- Kan, Frank W.**
see Bell, Glenn R., 56
- Kanafani, Adib**
see Hansen, Mark, 1053
- Kanellaidis, George**
see Gantes, Charis J., 939
- Kang, Kok Hin**

- see Balendra, Thambirajah, 272
- Kangari, Roozbeh**
Potential Robotics Utilization in Construction, 67
Prototype Robotics in Construction Industry, 77
see Farid, Foad, 66
- Kanj, N.**
see Gasparini, D. A., 807
- Karaa, Fadi A.**
Infrastructure Maintenance Management System Development, 258
Operations Management in Engineering Office, 767
- Karbhari, V. M.**
Quality Undergraduate Engineering Education—A Critical Perspective, 241
- Karbhari, Vistasp**
see Nicholls, Robert, 779, 857
- Kardara, A.**
Structural Response Variability III, 370
- Kareem, Ahsan**
Mapping and Synthesis of Random Pressure Fields, 407
- Kariyawasam, C.**
Economic Impact of Micro Catchment Development, 700
- Karlsson, Per-Ola**
Risk Assessment of Extreme Events: Application, 1090
- Karpurapu, Rajagopal**
see Selvadurai, A. P. S., 539
- Karshenas, Saeed**
Truck Capacity Selection for Earthmoving, 72
- Kasiraju, K.**
see Lee, S. L., 945
- Kato, Ben**
see Fukuta, Toshibumi, 907
see Morita, Koji, 911
see Tagawa, Yasuhisa, 908
- Kauffman, Claudia R.**
see Ting, John M., 467
- Kausel, Eduardo**
see Seale, Sandra H., 294
- Kavvas, M. L.**
see Delleur, J. W., 684
- Kayser, Jack R.**
Capacity Loss Due to Corrosion in Steel-Girder Bridges, 878
- Kayyali, O. A.**
Strength and Porosity of Portland Cement Paste Subjected to Chloride Penetration, 769
- Kazemi, A.**
see Goulter, I. C., 1022
- Keller, Robert J.**
Flow Measurement with Trapezoidal Free Overfall, 667
Sloping Crest Crump Weir, 676
- Kelly, James M.**
see Koh, Chan Ghee, 803
- Kelly, W. E.**
see Bogardi, I., 483
- Kemper, Robin A.**
Which Comes First—Responsibility or Liability?, 260
- Kennedy, A.**
see Patry, G. G., 1112
- Kennedy, John B.**
Welded- Versus Bolted-Steel I-Diaphragms in Composite Bridges, 810
- Kerr, Farnum W.**
Mediating Disputes: Land Development and Construction, 253
- Kersten, Miles S.**
The History of Frost Research in Minnesota, 134
- Ketter, R. L.**
see Hwang, J. S., 967
- Khalili, E. Nader**
Lunar Structures Generated and Shielded with On-site Materials, 31
- Khan, G. J.**
Verification of Kirkham's Problem of Layered Soil Drainage, 696
- Khan, Khusroo P.**
see Johnston, David W., 88
- Khan, M. Z. Ali**
see Abu-Rizaiza, O. S., 702
- Khasnabis, Snehamay**
Analysis of Heavy Truck Accident Data—Exposure Based Approach, 1035
- Khdeir, A. A.**
Stability of Antisymmetric Angle-Ply Laminated Plates, 321
- Khilnani, Kris**
see Capik, L. Michael, 1191
- Kholeif, I. A.**
Diffusion in Gas Under Constant Pressure Drop, 383
- Khor, C. H.**
Investigation of Crushed Rock Filters for Dam Embankment, 468
- Khudenko, Boris Mikhail**
Mathematical Models of Cementation Processes, 16
- Khuwair, Ibrahim H. S.**
see Lyon, John G., 32
- Klenow, Kenneth K.**
Pipe Soil Stiffness Ratio Effect on Flexible Pipe Buckling Threshold, 1023
- Kiger, S. A.**
Dynamic Skin-Friction Effects on Buried Arches, 893
- Kikuchi, Shinya**
Scheduling Method for Demand-Responsive Transportation System, 1056

Kilduff, James E.

Design and Construction of Leaching Systems in Fill Based on Permeability, 155

Kim, Byung R.

Comparing Options for Improving Dissolved Oxygen Below Hydropower Dam, 439

Removal of Toluene From Air Using PAC/Water Slurry Reactor, 202

Kim, Gwan

see Suzuki, Yutaka, 1062

Kim, Joong-Koo

see Bazant, Zdeněk P., 937

Kim, Ok-Kee

Effect of Increased Truck Tire Pressure on Asphalt Concrete Pavements, 1038

Kim, Sung-Hyun

Bioactive Adsorber Model for Industrial Wastewater Treatment, 217

King, W. Chris

Detection and Imaging of Buried Wastes Using Seismic Wave Propagation, 172

Kircher, Charles A., ed.

Seismic Engineering: Research and Practice, 1332

Kirkgöz, M. Salih

Turbulent Velocity Profiles for Smooth and Rough Open Channel Flow, 642

Kirkpatrick, Darrow

What is an "Ethical" Engineer?, 763

Kirkpatrick, Steven W.

Effect of Initial Imperfections on Dynamic Buckling of Shells, 328

Kirsch, Uri

The Effect of Compatibility and Prestressing on Optimized Trusses, 828

Kishel, Jeff

Seepage and Contraction Joints in Concrete Canal Linings, 686

Kishi, N.

see Chen, Wai-Fah, 791

Kitipornchai, Sritawat

Welded-Tee End Connections for Circular Hollow Tubes, 975

see Wang, Chien-Ming, 876

Kitmitto, K.

see Miles, J. C., 675

Klamerus, E.

see Shing, P. B., 918

Klisinski, Marek

see Frangopol, Dan M., 849

Knight, Arthur C. E.

Design of Efficient Side-Channel Spillway, 624

Knisel, W. G.

Irrigation Impact on Groundwater: Model Study in Humid Region, 720

see Shirmohammadi, A., 718

Knowles, Leel

Expert System for Evaluating and Notifying Hazardous Waste Generators, 108

Kobayashi, Albert S.

see Du, Jiaji, 396

Kobayashi, Nobuhisa

Wave Overtopping on Coastal Structures, 1139

Wave Transmission Over Submerged Breakwaters, 1165

Koehn, Enno

Fundamentals of Engineering Exam: Motivation/Review Enhances Pass Rate, 246

Koerner, Robert M.

see Deutsch, William L., 459

Koh, Chan Ghee

Viscoelastic Stability Model for Elastomeric Isolation Bearings, 803

Koir, Vello

Fast Track, Instant Track, 1268

Kokkinos, F. T.

see Spyarakos, C. C., 110

Kolkailah, Faysal A.

Numerical Representation of Bodner Viscoplastic Constitutive Model, 276

Koo, K. K.

Mixed Variational Formulation for Thin-Walled Beams with Shear Lag, 404

Koo, T. K.

PMCAD: Photogrammetric-Based CAD System for Traffic Accident Mapping, 1005

Korol, Robert M.

Finite Element Model for RHS Double Chord K-Joints, 848

Kotsanopoulos, P.

see Hatzikostantinou, E., 471

Kotsanopoulos, Panos

see Fotopoulou, Martha, 472

Koussis, Antonis D.

see Bowen, James D., 617

Kouwen, Nicholas

see Tao, Tao, 1122

Kozin, F.

see Bogdanoff, J. L., 351

Kramer, Steven L.

Stress-Path-Dependent Correction for Membrane Penetration, 549

Uncertainty in Steady-State Liquefaction Evaluation Procedures, 525

Kranenburg, C.

Internal Lee Waves in Turbulent Two-Layer Flow, 629

see Noppeney, R., 645

Krauthammer, Theodor

Lessons from Explosive Tests on RC Buried Arches, 833

Krauthammer, Theodor, ed.

Structures for Enhanced Safety and Physical Security, 1337

- Kranthammer, Theodor**
see Stevens, David J., 925
- Krawinkler, Helmut**
see Wallace, Benjamin J., 906
- Kreger, Michael E.**
Seismic Response of Imperial County Services Building in 1979, 971
- Krenk, Steen**
see Bjerager, Peter, 361
- Kreuzer, Harald**
Reliability Analysis of the Mohr Failure Criterion, 290
- Krishnamoorthy, Rajagopal**
Aerobic Sludge Stabilization—Factors Affecting Kinetics, 157
- Krizek, R. J.**
see Zebowitz, S., 545
- Kroeger, Lin**
see Richard, Diane L., 749
- Kroll, Charles N.**
see Vogel, Richard M., 1092
- Krone, Ray B.**
see Mehta, Ashish J., 614
- Kuang, J. S.**
see Chan, H. C., 305, 801
- Kuck, David L.**
Dependence of Lunar Bases on Phobos and Deimos, 39
- Kuesel, Thomas R.**
An Education in Tunneling, 1202
An Education in Tunneling, 1208
- Kuhlemeyer, R. L.**
see Wu, A. K. H., 517
- Kuhle, Roger A.**
Bed-Surface Size Changes in Gravel-Bed Channel, 592
- Kulatillake, Pinnaduwa H.S.W.**
Probabilistic Potentiometric Surface Mapping, 535
- Kulhawy, Fred H., ed.**
Foundation Engineering: Current Principles and Practices, 1318
- Kulshreshtha, Niraj P.**
Kinetics of Reaction of SO_2 with Marble, 773
see Gauri, K. Lal, 774
- Kumarasena, Thusitha**
Deer Isle Bridge: Efficacy of Stiffening Systems, 923
Deer Isle Bridge: Field and Computed Vibrations, 924
- Kuo, Shy-Rong**
see Yang, Yeong-Bin, 314
- Kuppusamy, T.**
see Clough, G. Wayne, 507
- Kuroda, M.**
Simplified Equations for Effectiveness Factors in Anaerobic Biofilms, 210
- Kuwabara, F.**
Downdrag Forces in Group of Piles, 491
- Kuwamura, Hitoshi**
Earthquake Load for Structural Reliability, 873
- Labadie, J. W., ed.**
Computerized Decision Support Systems for Water Managers, 1311
- Labadie, John W.**
see Fontane, Darrell G., 1114
- Labuz, J. F.**
Measurement and Description of Tensile Fracture in Granite, 382
- Ladd, Jonathan W.**
see Bock, Yehuda, 980
- Lade, Poul V.**
Cementation Effects in Frictional Materials, 523
see Hong, Won Pyo, 524
- Laden, Ethan M.**
see Haith, Douglas A., 170
- Ladick, Dennis R.**
see Touran, Ali, 62
- Lafleur, Jean**
Filtration of Broadly Graded Cohesionless Soils, 547
- Lagrosa, John L.**
see Mueller, James A., 194
- Lai, C. P.**
Interaction of Finite Amplitude Waves with Platforms or Docks, 1126
- Lai, Feizhou**
see Jayawardena, Amithirigala W., 176
- Lai, Wenje**
see Berthouex, P. M., 180
- Laler, James E.**
Assessing Site Assessments, 1273
- Lall, B. Kent**
see Qi, Xiao-Guang, 1010
- Lam, Thomas S. K.**
Shear Behavior of Regular Triangular Concrete/Rock Joints—Evaluation, 487
see Johnston, Ian W., 486
- Lam, Yow Thim**
Microcomputer Applications in Simulated CE Project, 757
- Lamb, Russell C.**
see Villaverde, Roberto, 799
- Lambert, Jerry**
see Broner, Israel, 723, 724
- Lambert, Steven**
see Hein, Günter W., 979
- Lambert, Steven R.**
Monitoring Crustal Deformation in Eastern Maine Using GPS, 988
- Lambrakos, Kostas F.**
see Verley, Richard L. P., 1136

- Lan, Yongqiang**
see Julien, Pierre Y., 6
- Lane, W. L.**
see Frevert, D. K., 683
- Lange, Clifford R.**
Mitigation of Biological Process Upsets Caused by Organic Inhibitors, 204
- Langley, R. B.**
see Quek, See Hean, 981
- Lannuzel, Pierre**
Evaluation of Heuristic Program for Scheduling Treatment Plant Pumps, 1100
- Lansley, Kevin E.**
Optimization Model for Water Distribution System Design, 632
Water Distribution System Design Under Uncertainties, 1111
- Lardner, Thomas J.**
see Lee, Chiou S., 271
- Larisch, Hans-Jürgen**
see Beckmann, Angela, 1006
- Larralde, Jesus**
see VanWijk, Adriaan J., 1026
- Larsen, Per K.**
see Skallerud, Bjørn, 798
- Larsson, Ragnar**
see Runesson, Kenneth, 364
- Latchaw, James L.**
see Wang, Yi-Tin, 160
- Latta, Leroy K., Jr.**
History and Method of Indian Allotment Surveys, 1008
- Lattemann, Jack**
see Rutherford, Scott R., 1189
- Lau, W. H. Otto**
see Coull, Alex, 896
- Lauffer, Alexander**
see Cohenca, Dora, 64
- Laurendine, T. T.**
see Han, K. J., 9
- Lauria, Jeffery M.**
see Pope, Richard J., 1244
- Lauritzen, Rolf**
see Andersen, Knut H., 534
- Larsen, Emmett M.**
First, Second, and Third Thoughts on Civil Engineering Education, 231
- Lawton, Evert C.**
Collapse of Compacted Clayey Sand, 515
- Lazarus, J. H.**
see Sive, A. W., 640
- Lazarus, John H.**
Mixed Regime Slurries in Pipelines: I. Mechanistic Model, 639
- Le Moigne, Guy J. -M.**
Future Irrigation Prospects and Actions in Developing World, 706
- LeClair, Raymond A.**
Upper Bound to Mechanical Power Transmission Losses in Wire Rope, 387
- Ledbetter, W. B.**
see Davis, Kent, 83
- Ledbetter, William B.**
see Cohenca, Dora, 64
- Lee, Chiou S.**
Buckling of Three-Dimensional Rigid—Link Model, 271
- Lee, Chung M.**
see Wen, Robert K., 861
- Lee, Dowon**
Modeling Phosphorus Transport in Grass Buffer Strips, 165
- Lee, G. C.**
see Chang, K. C., 291
see Huang, X. P., 138
see Hwang, J. S., 408, 967
see Shih, T. S., 940
- Lee, George C.**
see Tsai, Chong-Shien, 299
- Lee, J. K.**
see El-Tahan, W. W., 322
- Lee, Jiin-Jen**
see Lai, C. P., 1126
- Lee, Joseph H. W.**
Note on Ayoub's Data of Horizontal Round Buoyant Jet in Current, 606
- Lee, Robert H.**
see Benabdallah, Salah, 120
- Lee, S. L.**
Crack Control in Beams Using Deformed Wire Fabric, 945
see Balendra, T., 270
see Liew, J. Y. Richard, 888, 970
see Shanmugam, N. E., 948
- Lee, S. M.**
see Barber, M. J., 131
- Lee, Seung-Joon**
Cyclic Tests of Full-Scale Composite Joint Sub-assemblies, 905
Quasi-Static Tests of Scaled Model Building, 900
- Lee, V. W.**
see Todorovska, M. I., 427
- Lee, Vincent W.**
Diffraction of SV Waves by Circular Canyons of Various Depths, 389
- Lee, Y. C.**
Developments of Geographic Information Systems Technology, 1003
- Leick, Alfred**
see Hein, Günter W., 979
- Leissa, Arthur W.**

- Tension Buckling of Rectangular Sheets Due to Concentrated Forces, 432
- Lenhard, R. J.**
On the Correspondence Between Brooks-Corey and Van Genuchten Models, 716
- Lennox-Gratin, Ch.**
Effect of Envelopes on Flow Pattern Near Drain Pipe, 704
- Lenz, Robert G.**
Water Beneath the City Streets, 1251
- Leon, Roberto T.**
Interior Joints with Variable Anchorage Lengths, 921
- Leonard, R. A.**
see Knisel, W. G., 720
- Leshchinsky, Dov**
Geosynthetic Reinforced Soil Structures, 528
- Lester, Andrew Z.**
see Samstag, Randal, 1228
- Leu, Llang-Jenq**
Viscoelastic Stability of Columns on Continuous Support, 354
- Leung, Chun F.**
see Radhakrishnan, R., 488
- Levi, Enzo**
Search for the Cause of High-Speed-Channel Revetment Failures, 50
- Levine, Douglas W.**
see Golob, Thomas F., 1054
- Levine, Marie B.**
Dynamic Response Verification of Simplified Bridge-Foundation Model, 460
- Levitt, R. E.**
see Howard, H. C., 102
- Levy, Alan J.**
Model of Finite Strain Creep of Metals, 353
- Levy, Robert**
Optimal Design for Axisymmetric Cylindrical Shell Buckling, 367
- Lew, Michael**
see Wong, Kam W., 998
- Li, Chun T.**
see Shieh, Wen K., 145
- Li, P. M.**
Pressure Distribution in Radial Flow Between Disks, 274
- Li, Wei**
Finite Analytic Solution of Flow Over Spillways, 425
- Li, Wenchang**
see Cheung, M. S., 850
- Li, Zongjin**
Sinusoidal Forced Vibration of Sliding Masonry System, 891
- Liang, Han-Bin**
see Sobey, Rodney J., 1166
- Llaw, D. G.**
Reliability of Randomly Imperfect Beam-Columns, 403
- Libicki, Charles M.**
see Bedford, Keith W., 8
- Liebman, Jon C.**
Designing the Design Engineer, 243
- Liehr, Sarah K.**
Effect of Concentration Boundary Layer on Carbon Limited Algal Biofilms, 159
- Liew, J. Y. Richard**
Behavior of Thin-Walled Steel Box Columns Under Biaxial Loading, 970
Tapered Box Columns Under Biaxial Loading, 888
see Shanmugam, N. E., 948
- Lilly, E. K.**
see Johnson, R. A., 140
- Lin, Albert N.**
Torsional Response of Symmetric Structures, 277
- Lin, Feng-Bor**
Use of Binary Choice Decision Process for Adaptive Signal Control, 1033
- Lin, R. C.**
see Chung, L. L., 363
- Lin, S.**
see Li, P. M., 274
- Lin, T. D.**
Concrete Lunar Base Investigation, 22
- Lin, T. Y.**
see Chow, Philip Y., 21
- Lin, Y. K.**
see Bucher, C. G., 286
- Lindbergh, Charles**
see Lin, T. D., 22
- Lingras, Pawan J.**
see Sharma, Satish C., 1034
- Link, Lewis E.**
see Carlson, Robert F., 139
- Link, R. A.**
Biaxial Tension Stiffening Due to Generally Oriented Reinforcing Layers, 365
- Linker, R. A.**
see Hagerty, D. J., 1149
- Linsbauer, H. N.**
Simulation of Cracking in Large Arch Dam: Part I, 882
Simulation of Cracking in Large Arch Dam: Part II, 883
- Llong, S. Y.**
Roughness Values for Overland Flow in Subcatchments, 674
- Lipiński, Krzysztof**
see Wilmański, Krzysztof, 147
- List, George**
see Abkowitz, Mark, 1055

- Little, Gordon H.**
Large Deflections of Orthotropic Plates Under Pressure, 423
- Little, Keith W.**
Minimization of Raw Water Pumping Costs Using MILP, 1104
- Liu, Chi-Ho**
see Ho, Duen, 887
- Liu, Henry**
Strategies for Wind Damage Mitigation-Summary, 36
Wind Damage to Wood Frame Houses: Problems, Solutions, and Research Needs, 25
see Sparks, Peter R., 37
- Liu, Philip L.-F.**
see Yoon, Sung B., 1163
- Livingston, Eric E.**
see Bernold, Leonhard E., 122
- Llopiz, Carlos R.**
see Bertero, Viteimo V., 899
- Lo, Jen-Men**
see Tayfun, M. Aziz, 1157, 1161
- Lo, K. W.**
see Balendra, T., 270
- Loaiciga, Hugo A.**
Correlated Versus Uncorrelated Hydrologic Samples, 1116
Variability of Empirical Flow Quantiles, 554
- Lochhead, K.**
see Quek, See Hean, 981
- Loehr, Raymond C.**
see Krishnamoorthy, Rajagopal, 157
- Loftis, Bruce**
see Fontane, Darrell G., 1114
- Loftis, Jim C.**
see Houghtalen, Robert J., 1110
- Logan, Bruce E.**
Computer Simulation of DDT Distribution in Palos Verdes Shelf Sediments, 154
- Loganathan, Sabaratnam**
see Nishino, Fumio, 973
- Logcher, Robert D.**
Knowledge Processing for Construction Management Data Base, 71
- López-Almansa, F.**
Control Systems of Building Structures by Active Cables, 959
- Lord, Arthur E.**
see Deutsch, William L., 459
- Lovell, C. William**
see VanWijk, Adriaan J., 1026
- Low, Bak-Kong**
Stability Analysis of Embankments on Soft Ground, 458
- Low, Heng Seng**
Effect of Sediment Density on Bed Load Transport,

556

- Lu, Le-Wu**
see Lee, Seung-Joon, 900, 905
- Lucas, James R.**
Recent Advances in Kinematic GPS Photogrammetry, 984
- Lucas, Marc M.**
see Brand, Nicholas M., 1017
- Luchian, Horia D.**
see Stathopoulos, Theodore, 355
- Luco, J. Enrique**
see Mita, Akira, 473
- Luettich, Richard A., Jr.**
Thermally Induced Density Currents in Nonrectangular Sidearms, 628
- Lundberg, Eric J.**
Automated Lay-Down Yard Control System—ALYC, 94
- Lung, Wu-Seng**
Modeling Fate and Transport of Nutrients in the James Estuary, 199
- Lyon, John G.**
Cropland Measurement Using Thematic Mapper Data and Radiometric Model, 32
- Lytton, Robert L.**
see Chua, Koon Meng, 1032
see Uzan, Jacob, 1049
- McAnally, William H., Jr.**
see Mehta, Ashish J., 615
- McArthur, D.**
see Quek, See Hean, 981
- McBride, Robert R.**
Loss Prevention Resources, 232
- McCabe, Raymond J.**
see Fox, Gerard F., 1194
- McCabe, S. L.**
Assessment of Seismic Structural Damage, 916
- McClimans, S. A.**
see Townsend, Frank C., 540
- McCormick, Michael E.**
Analysis of Offshore Structural Dynamics with Nonproportional Damping, 1171
- McCracker, Bruce**
Storing Sediment and Freeing Fish, 1258
- McCrodden, Brian J.**
see Little, Keith W., 1104
- McCuen, Richard H.**
see Johnson, Peggy A., 625
- McDonald, James R.**
Review of Standard Practice for Wind-Resistant Manufactured Housing, 27
see Perry, Dale C., 26
see Tracy, Terence M., 28
- McDougal, William G.**
Seabed Stability Near Floating Structures, 1168

McEnroe, Bruce M.

Drainage of Landfill Covers and Bottom Liners:
Unsteady Case, 208

Steady Drainage of Landfill Covers and Bottom
Liners, 209

McFadden, Terry

Moisture Accumulation in Insulated Walls in Cold
Regions, 130

Macemehl, J. L.

see Bangs, A. S., 126

Macemehl, Jerry L.

Note on Nearshore Ice Gouge Depths in Alaskan
Beaufort Sea, 137

Note on New Ice Gouge Events in Alaskan
Beaufort Sea, 136

McLellan, James F.

Pipeline Deformation Monitoring Using GPS Sur-
vey Techniques, 982

McLellan, T. Neil

see Truitt, Clifford L., 1169

McNeil, Sue

see Rossi, Thomas F., 1063

McPhate, Andrew J.

see Kolkailah, Faysal A., 276

McPherson, D. D.

see Chandran, K. B., 375

McVay, M. C.

One-Dimensional Lagrangian Consolidation, 496
see Townsend, Frank C., 540

McWhorter, David B.

see Edgar, Thomas V., 522

Mader, Gerald L.

see Lucas, James R., 984

Madshus, Christian

see Dyvik, Rune, 533

Madugula, Murty K. S.

see Ekhande, Shantaram G., 813

Maestrini, Sérgio R.

see Gupta, Ajaya K., 842, 843

Magid, B. A.

see Jayapalan, Jey K., 1030

Magoon, Orville T., ed.

Coastal Zone '89, 1304

Coastlines of the World, 1307

Mahadevan, Sankaran

Efficient Algorithm for Stochastic Structural Op-
timization, 881

Mahin, S. A.

see Austin, M. A., 115

Mahin, Stephen A.

Pseudodynamic Test Method—Current Status and
Future Directions, 913

Mahmoodzadegan, Behnam

see Juran, Ilan, 538

Maidment, David R.

see Buchberger, Steven G., 182, 183

Maimone, Mark

Developing a Data Base for Use in Groundwater
Management, 1077

Maksimovic, Milan

Nonlinear Failure Envelope for Soils, 479

Malek, Aziz M.

Behavior of Foundation Clays Supporting Com-
pliant Offshore Structures, 481

Malek, Azziz M.

see Azzouz, Amr S., 482

Malik, Lincoln

see Astaneh, Abolhassan, 852

Malina, Joseph F., Jr., ed.

Environmental Engineering, 1316

Mallevalle, Joel

see Wiesner, Mark R., 142

Maloney, William F.

Organizational Culture: Implications for Manage-
ment, 743

Malvar, L. Javier

see Selna, Lawrence G., 840

Manandhar, Shyman K.

see Asaeda, Takashi, 569

Mani, J. S.

see Pranesh, M. R., 1170

Maniatty, Antoinette

Finite Element Analysis of Some Inverse Elasticity
Problems, 342

Method for Solving Inverse Elastoviscoplastic
Problems, 401

Manolis, G. D.

see Baker, D. J., 124

Manolis, George D.

see Pitarres, James M., 35

Mansur, M. A.

see Lee, S. L., 945

Mar, Brian W.

Does Civil Engineering Need System Engineering?,
227

see Palmer, Richard N., 758

Maragakis, Emmanuel A.

Estimation of the Inelastic Longitudinal Abutment
Stiffness of Bridges, 928

Mariño, Miguel A.

see Afshar, Abbas, 673

see Flynn, Lawrence E., 1106

see Hantush, Mohamed M. S., 1088

see Tracy, John C., 703, 727

see Wan, Yonghua, 1095

Marlowe, Christopher

see Meyniger, Rita, 1219

Marsh, Cedric

see Hanaor, Ariel, 847

Martel, James

- Development and Design of Sludge Freezing Beds, 189
- Martin, Derrel L.**
Evaluation of Irrigation Planning Decisions, 663
- Martin, Jonathan W.**
Effect of Contaminants and Cure Time on EPDM Single-Joint Strength, 780
- Martinez Calzón, Julio**
see Millanes, J. Francisco, 938
- Mase, Hajime**
Groupiness Factor and Wave Height Distribution, 1131
Random Wave Runup Height on Gentle Slope, 1164
- Maser, Kenneth**
From Guesswork to Guarantee?, 1264
- Mashaly, El-Sayed A.**
Seismic Risk Analysis of Buried Pipelines, 1031
- Mason, Peter J.**
Effects of Air Entrainment on Plunge Pool Scour, 573
- Massman, J. W.**
Applying Groundwater Flow Models in Vapor Extraction System Design, 149
- Matheson, Gordon M.**
Construction and Performance of Two Large Rockfill Embankments, 544
- Mathews, Alexander P.**
Particle Size and Shape Effects on Adsorption Rate Parameters, 143
- Mathey, Robert G.**
see Gross, James G., 43
- Matsumoto, Junji**
A Capacity Expansion Model for Hydrothermal Power Systems, 1082
- Matsumoto, Mark R.**
see Lange, Clifford R., 204
see Reed, Brian E., 193
- Mau, S. T.**
Buckling and Postbuckling Analyses of Struts with Discrete Supports, 307
Inelastic Buckling of Reinforcing Bars, 262
see Han, K. J., 9
- Mavaddat, Shahbaz**
see Dressel, Dirk J., 1221
- Maynard, Stephen T.**
Riprap Design, 604
- Mayo, Aloice W.**
Effect of Pond Depth on Bacterial Mortality Rate, 198
- Mays, Larry W.**
see Lansey, Kevin E., 632, 1111
- Mays, R. Ralph**
Beautiful Bridges, 1255
- Mayya, S. G.**
Systems Analysis of Tank Irrigation: I. Crop Staggering, 687
see Prasad, Rama, 688
- Mazars, J. M.**
Continuum Damage Theory—Application to Concrete, 284
- Maze, T. H.**
see Dutta, Utpal, 1045
see Ju, Rong-Shyang, 1043
- Meade, A. W.**
see Tatum, C. B., 70
- Meek, D. S.**
see Walton, D. J., 1042
- Mehnert, John F.**
see McDonald, James R., 27
- Mehta, Ashish J.**
Cohesive Sediment Transport Part I: Process Description, 614
Cohesive Sediment Transport Part II: Application, 615
- Meis, D. Ronald**
The Program Manager: Mind Over Machine, 1224
- Melchers, R. E.**
Human Error in Structural Design Tasks, 895
- Melchers, Robert E.**
see Stewart, Mark G., 864, 932
- Melerski, Edmund**
Circular Plate Analysis by Finite Differences: Energy Approach, 337
- Melosh, R. J.**
New Formulation for Vibration Analysis, 296
- Menkenhagen, J.**
see Rozvany, G. I. N., 273
- Mentrasti, Lando**
Torsional Stress Concentration in Thin-Walled Beams, 379
- Merino, Donald N.**
Predesign Planning for Parking Facilities, 759
- Merrit, Clifford**
The CADD Landfill, 1227
- Merritt, David H.**
see Fontane, Darrell G., 1114
- Meserve, Robert L.**
see Karaa, Fadi A., 767
- Meyniger, Rita**
The Model Cleanup, 1219
- Milazga, Thomas J.**
see Gordon, Mark E., 510
- Michalowski, Radoslaw L., ed.**
Cold Regions Engineering, 1308
- Michel, Henry L.**
Meeting the Challenge: Working Together on Transportation Infrastructure, 762
Our Most Important Resource: People, 751
- Mickleborough, N. C.**
see Pi, Yong Lin, 402

AUTHOR INDEX

Morkoc

Midorikawa, Mitsumasa

Analytical Evaluation of K-Braced Structure Seismic Test, 902

see Yamanouchi, Hiroyuki, 901

Mih, Walter C.

Equations for Axisymmetric and Two-Dimensional Turbulent Jets, 656

Mijatov, Milos M.

see Fertis, Demeter G., 405

Miles, J. C.

New Drain Flow Formula, 675

Millanes, J. Francisco

Automatic Evolutionary Analysis of Complex Composite Bridges and Systems, 938

Miller, L. L.

Reclamation of Exxon Ray Point Tailings Basin, 444

Miller, Paul

see Powledge, George R., 612, 613

Miller, Robert D.

Quality Through Project Peer Reviews, 221

Miller, Sky

Dam-Break Flows in Curved Channel, 637

Miller, William J.

see Hall, Stephen K., 657

Milošević, Zoran

see Filipović, Vladeta, 728

Mindess, Sidney

see Banthia, Nemkumar, 778

Miner, Dallas, ed.

see Magoon, Orville T., ed., 1304

Minkarah, Issam

Expert Systems as Construction Management Tools, 745

Minkel, David H.

GPS Antenna Set-Up Procedures and Error Sources, 1002

Kinematic GPS Land Survey—Description of Operational Test and Results, 987

Minor, John

see Woodward, Clinton, 770

Mirza, Farooque A.

see Korol, Robert M., 848

Mirza, M. Saeed

see Igwezezie, Jude O., 816

Mirza, S. A., Prof.

see Li, P. M., 274

Mishra, S.

see Lenhard, R. J., 716

Misra, Anil

see Chang, Ching S., 306, 311

Mita, Akira

Impedance Functions and Input Motions for Embedded Square Foundations, 473

Mitchell, J. K.

see Brandon, T. L., 448, 543

Mitri, Hani S.

see Korol, Robert M., 848

Mitwally, Hisham

Wave Forces on Fixed Offshore Structures in Short-Crested Seas, 301

Mizumura, Kazumasa

Hydrologic Approach to Prediction of Sediment Yield, 581

Mlynarek, Jacek

see Lafleur, Jean, 547

Moavenzadeh, Fred

They're Coming to America, 1280

Mochio, Takashi

see Simulescu, Ion, 292

Mofid, Massoud

see Akin, John E., 792

Mohan, S.

see Baker, D. J., 124

Mohsin, R. A.

Performance and Building: Problems of Evaluation, 58

Molaghasemi, Hamid R.

see Harik, Issam E., 429

Mollah, M. A.

see Ismael, Nabil F., 546

Monasa, Frank F.

see Roufaei, Magdy S. L., 109

Monteiro, Paulo J. M.

see Ju, Jiann-Wen, 268

Moody, Russell C.

see Bohnhoff, David R., 946

see Schmidt, Richard J., 797

Moore, Dwight G., Jr.

see Osborne, Michael C., 175

Moore, Ian D.

Elastic Buckling of Buried Flexible Tubes—A Review of Theory and Experiment, 465

Response of Buried Cylinders to Surface Loads, 1

Moore, Stephen B.

Selenium in Agricultural Drainage: Essential Nutrient or Toxic Threat?, 659

Moorman, Charlton Kent

Does Ethical Engineering Practice Affect Creativity?, 4

Moreau, David H.

New Federalism and Social and Environmental Goals, 1071

Mori, Hiroshi

see Tanigawa, Yasuo, 293

Morita, Koji

Strength and Deformability of Steel Column Footing, 911

Morkoc, F.

River Quality Modeling: Time Domain Approach,

707

Morkoo, F.

River Quality Modeling: Frequency Domain Approach, 731

Morris, Douglas I.

see Amadei, Bernard, 436, 437

Morris, G. Robert

see Kumarasena, Thusitha, 923, 924

Morris, Martin D.

Actions Necessary to Make Civil Engineering More Attractive to High-Quality High School Students, 237

Morrison, Peggy

Managing Change in the Midst of Economic Uncertainty, 750

Morse, Brian

Modeling Mixed Sediment Suspended Load Profiles, 594

Morse, Dan

Accelerating Electrons, 1211

Geosynthetic Shields For Dams, 1181

Orchestral Maneuvers, 1197

Seismic Codes: Preparing for the Unknown, 1285

Sludge in the Nineties, 1246

Tapping A Glacier, 1235

What's Wrong With Superfund, 1204

Moses, Fred

see Verma, Dharendra, 879

Moss, P. J.

see Turkington, D. H., 965, 966

Moss, Peter J.

see Bhimaraddi, Alavandi, 391

Mossbarger, W. A., Jr.

Effects of Irrigated Agriculture on Groundwater Quality in Corn Belt and Lake States, 717

Mossman, Deborah J.

Post-Audit Study of Dieldrin Bioconcentration Model, 181

Moussa, Ragab M.

Effect of Platoons on Permissive Left-Turn Capacity: Pilot Study, 1029

Mueller, James A.

Fine-Pore Diffuser Retrofit at Ridgewood, New Jersey, 194

Müftüoğlu, R. Ferruh

see Ağralioğlu, Necati, 588

Murff, James D.

see Wagner, David A., 1137

Murthy, K. Keshava

Inverted V-Notch: Practical Proportional Weir, 733

Murton, Gary J.

see Bullock, Geoffrey N., 1125

Musacchio, John

Countering Terrorist Threats, 1230

Muscolino, Giuseppe

Mode-Superposition Methods for Elastoplastic

Systems, 400

Muspratt, Murray A.

Technology and the Constitution, 238

Mustafa, Salihu

Nonlinear Steady State Seepage into Drains, 685

Myhre, Doug

Commuter Control, 1185

Myrhaug, Dag

Simple Approach to Air and Water Drag on Sea Ice, 1154

Naaman, Antoine E.

see Otter, Duane E., 953

Nachnebel, H. P.

see Duckstein, L., 445

Nader, Marwan N.

see Astaneh, Abolhassan, 852

Nafday, Avinash M.

see Corotis, Ross B., 931

Najarian, Tavitt O.

see DiLorenzo, Joseph L., 152

Nakai, Masanori

see Asaeda, Takashi, 569

Nakamura, Brian

see English, Marshall, 672

Nakamura, Takuji

see Hasebe, Norio, 333, 431

Nakamura, Tsuneyoshi

Ductility Design Via Optimum Design of Nonlinear Elastic Frames, 821

Nakashima, Masayoshi

see Yamazaki, Yutaka, 912

Nakato, Tatsuaki

Unconventional Power Sources for Ice Control at Locks and Dams, 133

Nakayama, Hideo

see Oda, Masanobu, 267

Nam, C. H.

Toward Understanding of Product Innovation Process in Construction, 93

Namini, Ahmad H.

see Schelling, D., 915

Nandagiri, Showri

see Ivor-Smith, Douglas, 1286

Naraine, Krishna

Behavior of Brick Masonry Under Cyclic Compressive Loading, 872

Loading and Unloading Stress-Strain Curves for Brick Masonry, 944

Narasiah, K. S.

see Satish, Mysore G., 610

Narasimha Prasad, N. B.

see Rajagopalan, S. P., 1083

Nard, Georges Pierre

GPS Geodesy and Kinematic Topography Measurements and Results, 991

- Nath, Yogendra**
see Jain, Rakesh K., 424
- Nathan, G. K.**
see Balendra, Thambirajah, 272
- Naudts, Alex**
Grouting Trends, 1274
- Nayfeh, Ali H.**
Vertical Vibration of Machine Foundations, 449
- Neathammer, Robert**
see Neely, Edgar Samuel, Jr., 107
- Neely, Edgar Samuel, Jr.**
Computerized Life-Cycle Cost Systems in the Army, 107
- Nelson, Arthur C.**
Exurban Living Using Improved Water and Waste-water Technology, 1066
Impact Fee Program for Fulton County, Georgia, 1061
- Nelson, J. D.**
see Abt, S. R., 443
- Nelson, James K., Jr., ed.**
Computer Utilization in Structural Engineering, 1310
- Nelson, John D.**
see Edgar, Thomas V., 522
- Nerby, Steven M.**
see Finno, Richard J., 505
- Neuman, S. P.**
see Guzman, A. G., 649
- Neumann, Edward S., ed.**
see Bondada, Murthy V. A., ed., 1299
- Neves, Claudio, ed.**
Coastlines of Brazil, 1305
- Nguyen, Van-Thanh-Van**
New Plotting Position Formula for Pearson Type-III Distribution, 591
- Nicholls, Robert**
Fold and Bond Construction of Cement Laminated Structural Shapes, 779
Nondestructive Load Predictions of Concrete Shell Buckling, 857
- Nielsen, D. R.**
see Morkoc, F., 707
see Morkoo, F., 731
- Nielsen, Hans Bruun**
Methods for Analyzing Pipe Networks, 557
- Nielsen, Peter**
Analysis of Natural Waves by Local Approximations, 1148
- Ning, Qian**
see Xingkui, Wang, 595
- Ninomiya, K.**
see Baba, S., 421
- Nishino, Fumio**
Design Analysis of Cable Networks, 973
- Influential Mode of Imperfection on Carrying Capacity of Structures, 397**
- Nishiyama, Isao**
see Fukuta, Toshibumi, 907
see Midorikawa, Mitsumasa, 902
see Yamanouchi, Hiroyuki, 901
- Noell, John**
see Todd, David A., 179
- Noland, J. L.**
see Shing, P. B., 918
- Nonaka, Taijiro**
Elastic-Plastic Bar Under Changes in Temperature and Axial Load, 969
- Noor, Ahmed K.**
A Posteriori Estimates for the Shear Correction Factors in Multilayered Composite Cylinders, 338
Stress, Vibration and Buckling of Multilayered Cylinders, 789
- Noorany, Iraj**
Classification of Marine Sediments, 447
- Noppene, R.**
Dilution Discharge Measurement during Flood Wave, 645
- Norman-Gregory, Gillian M.**
Analytical Model for Longitudinal Soil Vibration, 463
Volume Change Behavior of Vibrated Sand Columns, 462
- Normile, Dennis**
see Skibniewski, Miroslaw, 1222
- Norum, D. I.**
see Thooyamani, K. P., 670
- Nouraeian, Abdolrahim**
see Troitsky, Michael S., 974
- Nouri, Hasan**
Building A Better Wetland, 1245
- Noutsopoulos, George C.**
Axial Dilution in Obstructed Round Buoyant Jet, 553
- Novak, Milos**
see Mitwally, Hisham, 301
- Novotny, Vladimir**
Rainfall-Runoff Transfer Function by ARMA Modeling, 631
- Nowak, Andrzej S.**
see Kayser, Jack R., 878
- Nunan, William L.**
see Elgaaly, Mohamed, 880
- Obilade, T. O.**
see Ajayi, Owolabi, 608
- O'Brien, Arthur J.**
see Fellenius, Bengt H., 501
- Ochoa, Mauricio**
Lateral Pile Interaction Factors in Submerged Sand, 466

- Ochs, Walter J.**
see Le Moigne, Guy J. -M., 706
- O'Connor, Carol A.**
see Bhaskar, Nageswar R., 1121
- O'Connor, Donald J.**
Models of Sorptive Toxic Substances in Freshwater Systems. I. Basic Equations, 13
Models of Sorptive Toxic Substances in Freshwater Systems. II: Lakes and Reservoirs, 14
Models of Sorptive Toxic Substances in Freshwater Systems. III: Streams and Rivers, 15
Seasonal and Long-Term Variations of Dissolved Solids in Lakes and Reservoirs, 216
- O'Connor, J. T.**
see Hughes, P. J., 85
- Oda, Masanobu**
Yield Function for Soil with Anisotropic Fabric, 267
- Odgaard, A. Jacob**
River-Meander Model: I. Development, 635
River-Meander Model: II. Applications, 636
- O'Donoghue, Tom**
see Bree, Jim, 279
- Oduyemi, K. O. K.**
see West, J. R., 577
- Oehlers, Deric John**
Splitting Induced by Shear Connectors in Composite Beams, 806
- Oh, Jin Y.**
see Sharma, Satish C., 1057
- Okumura, Mikiya**
see Hasebe, Norio, 333
- Olowokere, O. D.**
see Youssef-Agha, W., 820
- Olsen, Harold W.**
Sensitive Strata in Bootlegger Cove Formation, 514
- O'Neill, Michael W.**
see Dunnivant, Todd W., 451
see Ochoa, Mauricio, 466
- Oppenheim, Irving J.**
Limit State Analysis of Masonry Domes, 837
- Orabi, Ismail I.**
Hysteretic Column Under Earthquake Excitations, 264
- Oriob, Gerald T.**
see Arnold, Uwe, 1120
- Ormsbee, Lindell E.**
Implicit Network Calibration, 1087
Methodology for Improving Pump Operation Efficiency, 1081
Rainfall Disaggregation Model for Continuous Hydrologic Modeling, 580
- Orofino, James F., ed.**
Structural Materials, 1336
- Oron, Gideon**
Effect of Dikes and Sulfuric Acid on Cotton Under Effluent Irrigation, 692
- Ortiz, M.**
Extraction of Constitutive Data from Specimens Undergoing Strain Localization, 371
- Ortolano, Leonard**
see Lannuzel, Pierre, 1100
- Osborn, M. D.**
see Guzman, A. G., 649
- Osborne, Michael C.**
Radon Reduction in Crawl Space House, 175
- Ostendorf, David W.**
see Havis, Robert N., 190
- Osterberg, Jorj O.**
Necessary Redundancy in Geotechnical Engineering, 532
- Osula, Douglas O. A.**
Evaluation of Admixture Stabilization for Problem Laterite, 1059
- Oto, Allan**
see Ford, David T., 1101
- Ott, Kenneth J.**
see Weigel, Terence A., 106
- Otter, Duane E.**
Model for Response of Concrete To Random Compressive Loads, 953
- Ouellet, Yvon**
Wave Grouping Effect on Irregular Wave Agitation in Harbors, 1147
- Ounis, Hadj**
Motions of Small Rigid Spheres in Simulated Random Velocity Field, 394
- Overton, Daniel D.**
see Lade, Poul V., 523
- Ozcebe, Guney**
Hysteretic Shear Model for Reinforced Concrete Members, 793
- Packer, Jeffrey A.**
Limit Analysis of Bolted RHS Flange Plate Joints, 919
- Padmanabhan, G.**
see Woodbury, Lawrence H., 1091
- Padmanabhan, S.**
see Rajasekaran, Sundaramoorthy, 329
- Pal, Pin-Chieh**
see Wang, Yi-Tin, 160
- Paiva, Joseph V. R.**
see Wethington, Robert L., 977
- Pak, Pyong Sik**
see Suzuki, Yutaka, 1062
- Palassopoulos, G. V.**
Optimization of Imperfection-Sensitive Structures, 366
- Paliwal, D. N.**
Stability of Spherical Shells on Elastic and Viscoelastic Foundations, 331

- Pallaki, Sudhakar**
see Fertis, Demeter G., 414
- Palmer, Joel D.**
Several Sources of Nonuniformity in Irrigation Delivery Flows, 725
- Palmer, Richard N.**
Automation of Civil Engineers: Some Observations, 758
see Mar, Brian W., 227
- Papadakis, Constantine N.**
see Beskos, Dimitri E., 325
- Papia, Maurizio**
Compressive Concrete Strain at Buckling of Longitudinal Reinforcement, 808
- Pappas, Peter G.**
see Wall, John F., 30
- Parent, William F.**
see Matheson, Gordon M., 544
- Park, Inbo**
see Jain, Subhash C., 571
- Park, Young J.**
see Seidel, Michael J., 917
- Parke, Gerard A. R.**
see Hanaor, Ariel, 847
- Parker, Gary**
see Johannesson, Helgi, 567, 611
- Parker, J. C.**
see Lenhard, R. J., 716
- Parker, W. Reginald**
see Mehta, Ashish J., 614
- Parkhill, D.**
see Quek, See Hean, 981
- Parks, M. B.**
see Santaputra, C., 936
- Parsons, Gerald M.**
see Banset, Elizabeth A., 245
- Parulekar, Atul**
see Plesha, Michael E., 426
- Pasquarell, Gary C.**
Boundary Conditions for Planar Granular Flows, 341
- Patania, Nancy**
see Jacangelo, Joseph G., 1220
- Paiel**
see Spyarakos, C. C., 110
- Patel, Bhupendra K.**
see Arditi, David, 68
- Patry, G. G.**
Pollutant Washoff Under Noise-Corrupted Runoff Conditions, 1112
- Patry, Gilles G.**
Modeling of Dynamic Systems: An Innovative Approach, 111
- Paulson, B. C.**
see Howard, H. C., 102
- Paulson, Boyd C., Jr.**
Simulating Construction Robot Agents and Their Knowledge Environment, 121
- Payton, Elizabeth A.**
see Bredecke, Charles M., 1115
- Paz, Mario**
Modified Dynamic Condensation Method, 800
- Pearson-Kirk, D.**
see Baluch, M. H., 777
- Pecknold, David A.**
Load Transfer Mechanisms in Wind-Loaded Cylinders, 409
- Peicheng, Hu**
Relief Valve and Safety Membrane Arrangement in Lieu of Surge Tank, 440
Tests of Jet Pump Operating under Head of 300 M, 441
- Peirce, J. Jeffrey**
see Everett, Jess W., 164
- Pell, Kynric M., ed.**
see Chong, Ken P., ed., 1341
- Pennoal, C. R.**
Action Versus Planning, 747
- Perdikaris, P. C.**
see Gasparini, D. A., 807
- Perego, U.**
Role of Damping in Anomalous Response to Short Pulse Loading, 434
- Perkins, Scott B.**
see Finno, Richard J., 504
- Perram, David L.**
see Crittenden, John C., 174
- Perry, Dale C.**
Strategies for Mitigating Damage to Metal Building Systems, 26
- Perumal, Muthiah**
Unification of Muskingum Difference Schemes, 582
- Pessen, D.**
Design of Dilution Junctions for Water-Quality Control, 1124
- Peterka, J. A.**
Mitigation of Wind Effects on Aerospace Launch Facilities, 24
- Peterka, Jon A.**
see Boggs, Daryl W., 300
- Peters, Jeanne M.**
see Noor, Ahmed K., 338, 789
- Petrolito, Joseph**
Finite Strip-Elements for Thick Plate Analysis, 335
- Peyton, R. Lee**
Field Verification of HELP Model for Landfills, 20
- Philippacopoulos, A. J.**
Axisymmetric Vibration of Disk Resting on Saturated Layered Half-Space, 406

- Phillips, James B.**
see Johnston, David W., 88
- Phipps, Alan R.**
see Poston, Randall W., 19
- Pi, Yong Lin**
Modal Identification of Vibrating Structures Using ARMA Model, 402
- Pietrzak, J. D.**
see Kranenburg, C., 629
- Pijaudier-Cabot, G.**
see Mazars, J. M., 284
- Pijaudier-Cabot, Gilles**
see Bazant, Zdeněk P., 309
- Pillai, N. Narayana**
Hydraulic Jump Type Stilling Basin for Low Froude Numbers, 609
- Piluk, Richard J.**
Evaluation of On-Site Waste Disposal System for Nitrogen Reduction, 184
- Pingel, Laura J.**
see Kim, Byung R., 202
- Pintag, Gerhard**
Capital Cost and Operations of High-Speed Rail System in West Germany, 1019
- Piotrowski, Michael R.**
Bioremediation: Testing the Waters, 1247
- Pirbazari, Massoud**
see Kim, Sung-Hyun, 217
- Pister, K. S.**
see Austin, M. A., 115
- Pitarres, James M.**
Structural Control by Temporal Finite Elements, 35
- Pleban, Shlomo**
Improved Approach to Irrigation Scheduling Programs, 701
- Plesha, Michael E.**
Constitutive Model and Finite Element Procedure for Dilatant Contact Problems, 426
- Plesniak, Michael W.**
see Swann, Thomas F., Jr., 646
- Poggemeyer, Lester H.**
New Frontiers in Civil Engineering: Infrastructure, 254
- Pohl, J. G.**
see Howard, H. C., 102
- Poirier-Elliott, Michael L.**
see Nelson, Arthur C., 1061
- Polensek, Anton**
Predicting Creep of Nailed Lumber-to-Plywood Joints, 399
- Pope, Richard J.**
Odors: The Other Effluent, 1244
- Popov, Egor P.**
see Ricles, James M., 909
- Poran, Chaim J.**
Properties of Solid Waste Incinerator Fly Ash, 508
- Porter, Max L.**
see Abendroth, Robert E., 790
- Porter, Todd R.**
see McLellan, James F., 982
- Ports, Michael A., ed.**
Hydraulic Engineering, 1322
- Poston, Randall W.**
Effects of Transverse Prestressing in Bridge Decks, 19
- Potter, Kenneth W.**
see Fontaine, Thomas A., 643
- Poulos, H. G.**
see Kuwabara, F., 491
- Poulos, Harry G.**
Cyclic Axial Loading Analysis of Piles in Sand, 493
- Powers, J. P.**
see Lenz, Robert G., 1251
- Powledge, George R.**
Mechanics of Overflow Erosion on Embankments: Part I—Research Activities, 612
Mechanics of Overflow Erosion on Embankments: Part II. Hydraulic and Design Considerations, 613
- Pramono, Eddy**
Fracture Energy-Based Plasticity Formulation of Plain Concrete, 336
- Pranesh, M. R.**
Wave-Tubular Member—Wave and Current Interaction, 1170
- Prasad, Anumolu M.**
see Veletsos, Anestis S., 841
- Prasad, Rama**
Systems Analysis of Tank Irrigation: II. Delayed Start and Water Deficit, 688
see Mayya, S. G., 687
- Prasannan, Santosh**
see Bazant, Zdeněk P., 368, 369
- Prato, C. A.**
Bending of Multi-Bin RC Cylindrical Silos, 977
- Prendergast, J.**
The Battle Over Burning, 1238
- Prendergast, John**
High-Rise Embankments, 1267
The Race for Smart Cars, 1279
- Prevost, Robert C.**
see Kienow, Kenneth K., 1023
- Preziosi, Dominic**
Award for an A-Frame, 1241
Setting Sights on Safety, 1177
- Price, P. St. J.**
see McLellan, James F., 982
- Pridal, Daniel B.**
Routing Procedure for Ungaged Channels, 1079
- Pridmore, R. D.**

AUTHOR INDEX

Rao

- see Rutherford, J. C., 1098
- Priscoli, Jerome Dell**
Public Involvement, Conflict Management: Means to EQ and Social Objectives, 1072
- Pritchard, David F.**
Pitfalls in Subconsultant and Vendor Contracting for Consulting Engineers, 753
- Providakis, Constantine P.**
see Beskos, Dimitri E., 324
- Publications Committee of the Geotechnical Engineering Division**
Journal-Paper Review Procedure and Statistics, 461
- Puckett, J. A.**
Ultimate Strength of Wood Walls in Tension—Pilot Study, 894
- Puckett, Jay A.**
Linking Civil Engineering Design and Drafting Software via IGES, 116
- Punuru, Adinarayana R.**
see Gauri, K. Lal, 774
see Kulshreshtha, Niraj P., 773
- Pusheng, Zheng**
see Peicheng, Hu, 440
- Puterman, Moshe**
see Jaegermann, Chanoch, 771
- Putnam, Stephen P.**
Down on the Farm, 1198
- Pyle, Bobby E.**
see Osborne, Michael C., 175
- Qi, Xiao-Guang**
Application of Graph Theory to Computer-Assisted Mapping, 1010
- Qin, Ren**
see Zander, Amy K., 187
- Quek, See Hean**
Development of a GPS Active Control Point Station, 981
- Quint, Bob**
see Fiedler, Bill, 1214
- Raamachandran, J.**
Bending of Circular Plates Supported at Number of Points, 289
- Rabbani, Naser F.**
see Troitsky, Michael S., 867
- Rad, N. Shafii**
see Clough, G. Wayne, 507
- Rada, Gonzalo R.**
Analysis of Climate Effects on Performance of Unpaved Roads, 1041
- Radhakrishnan, N.**
see Tracy, Fred T., 119
- Radhakrishnan, R.**
Load Transfer Behavior of Rock-Socketed Piles, 488
- Radwan, A. Essam**
see Abkowitz, Mark, 1055
- Radzinski, James B.**
see Azizinamini, Atorod, 964
- Rafindadi, N. A.**
see Mustafa, Saliu, 685
- Raghu, Dorairaja**
Performance of Some Structures Constructed on Chromium Ore Fills, 48
- Raghu Prasad, B. K.**
Inelastic Torsional Response of a Single Story Framed Structure, 373
- Rahuel, J. L.**
Modeling of Riverbed Evolution for Bedload Sediment Mixtures, 641
- Rai, R. N.**
see Paliwal, D. N., 331
- Raja, Meenakshi**
see Chatterjee, Arun, 1051
- Rajagopal, K.**
see Bhargava, D. S., 214
- Rajagopalan, Raj**
see Adin, Avner, 188
- Rajagopalan, S. P.**
Subsurface Water in River Beds as Source of Rural Water Supply Schemes, 1083
- Rajapakse, R. K. N. D.**
Dynamic Response of Elastic Plates on Viscoelastic Half Space, 378
- Rajasekaran, Sundaramoorthy**
Buckling Analysis of Segmented Conical Concrete Shell Roof, 877
Equations of Curved Beams, 329
- Ralston, David C.**
see Powledge, George R., 612, 613
- Ram, Sewa**
see Khan, G. J., 696
- Ramamurthy, A. S.**
Blockage Correction for Sharp-Edged Bluff Bodies, 360
Open Channel Flow Through Transverse Floor Outlets, 678
- Ramamurthy, Amruthar**
see Satish, Mysore G., 610
- Ramaswamy, Ananth**
see Herrmann, Leonard R., 930
- Ramberg, Steven E.**
see Swean, Thomas F., Jr., 646
- Ramirez, Julio A.**
see Benabdallah, Salah, 120
- Ranganayakamma, B.**
see Durelli, A. J., 287
- Rao, A. Ramachandra**
Hale Cycle and Indian Drought and Flood Area Indexes, 682
- Rao, A. S. Prasada**
Creep and Shrinkage Analysis of Partially Prestressed Concrete Members, 856

- Rao, K. Balaji**
see Desayi, Prakash, 914
- Rashed, Ahmed I.**
see Ju, Jiann-Wen, 268
- Rasmussen, K. J. R.**
Compression Tests of Welded Channel Section Columns, 832
- Ratay, Robert T.**
Wind Design Problems with Building Structures During Construction, 29
- Rathgeber, Eric**
see Buerk, Gunter, 1195
- Rawnsley, Robert P.**
see Hansmire, William H., 454
- Ray, Bill T.**
Sludge Digestion by Anaerobic Fluidized Beds: II—Kinetic Model, 212
see Huang, Ju-Chang, 211
- Ray, Richard P., ed.**
see Elton, David J., ed., 1329
- Rayburn, Larry M.**
Productivity Database and Job Cost Control Using Microcomputers, 98
- Razaqpur, A. Ghani**
Beam-Column Element on Weak Winkler Foundation, 274
- Read, Eleanor J.**
see Clark, Robert M., 146
- Rebhun, Menahem**
see Dishman, C. Michael, 233
- Recker, Wilfred W.**
see Golob, Thomas F., 1054
- Reda, Rehab**
Time-Cost Trade-off Among Related Activities, 90
- Reed, Brian E.**
Improvements in Soil Absorption Trench Design, 193
- Reed, Gregory D.**
see King, W. Chris, 172
- Reed, Kunt**
see Verley, Richard L. P., 1136
- Regan, Paul E.**
see Shehata, Ibrahim A. E. M., 890
- Reike, M.**
see Pessen, D., 1124
- Reilly, Thomas E.**
Bias in Groundwater Samples Caused by Wellbore Flow, 566
- Reinhardt, Hans W.**
see Yankelevsky, David Z., 795
- Reinborn, A. M.**
see Chung, L. L., 363
see Rodellar, J., 339
- Reinborn, Andrei M.**
see Seidel, Michael J., 917
- Rencis, Joseph J.**
Error Estimation for Boundary Element Analysis, 386
- Replogle, J. A.**
see Clemmens, A. J., 665
- Reuss, Mark C.**
Attracting Today's Youth to Civil Engineering, 251
- Rhee, Jong-Ho**
see Kikuchi, Shinya, 1056
- Rice, Dale A.**
Modeling Thermal Stratification in Transparent Adirondack Lake, 1099
- Rice, R. C.**
see Bouwer, Herman, 699
- Richard, Diane L.**
Messages: Clear and Effective, 749
- Richardson, A. S., Jr.**
Paradox Unresolved, 318
- Ricles, James M.**
Composite Action in Eccentrically Braced Frames, 909
- Ridgley, Mark A.**
Water and Urban Land-Use Planning in Cali, Colombia, 1119
- Rigg, Timothy J.**
see Crittenden, John C., 174
- Riggs, Leland S.**
Interactive Graphing of Simulation Networks, 112
Numerical Approach for Generating Beta Random Variables, 113
- Riker, Richard E.**
see Fellenius, Bengt H., 501
- Ritter, W. F.**
Irrigated Agriculture and Water Quality in the East, 719
- Rizaiza, Omar S. Abu**
Water Requirements Versus Water Availability in Saudi Arabia, 1076
- Roberts, Craig C.**
Intermittent Project Management, 741
- Roberts, Philip J. W.**
Ocean Outfalls. I. Submerged Wastefield Formation, 550
Ocean Outfalls. II: Spatial Evolution of Submerged Wastefield, 551
Ocean Outfalls. III: Effect of Diffuser Design on Submerged Wastefield, 552
- Roberts, Ronald W.**
Cincinnati's Dream Team, 1236
- Roberts, T. M.**
Shear and Normal Stresses in Adhesive Joints, 415
- Robinson, D. N.**
see Arnold, S. M., 327
- Robinson, John H., Jr.**
Managing A Branch Office, 735
- Robison, Rita**

- Box Segmentals: Refining Design, 1270
 Bullwinkle, 1234
 Fabric Meets Cable, 1188
 Isolated Examples, 1284
 The Jet Set, 1283
 Multipoint Monitoring, 1253
 Preventive Maintenance: Fixing What Ain't Broke, 1261
- Rocha, Rodney**
 see Gerhold, Carl H., 33
- Rodellar, J.**
 Experimental Digital Control of Structures, 339
 Stable Predictive Control of Open-Channel Flow, 710
 see López-Almansa, F., 959
- Rodgers, Audrey P.**
 The Pros and Cons of Public Education, 1193
- Rodrique, Peter**
 see Arndt, Roger E. A., 626
- Roeder, Charles W.**
 Seismic Behavior of Concentrically Braced Frame, 897
- Roenker, Gerald**
 Managing to be Profitable in Design Business: A Case Study, 739
- Roesner, Larry A., ed.**
 Design of Urban Runoff Quality Controls, 1314
- Rojanakamthorn, Somchai**
 see Vongvisessomjai, Suphat, 1130
- Rollin, André L.**
 see Lafleur, Jean, 547
- Roman, Vasile G.**
 Analysis of Large-Diameter Fabricated Steel Tubes Under Transverse Shear, 422
- Ronold, Knut O.**
 Probabilistic Consolidation Analysis with Model Updating, 457
- Rosenthal, G. N.**
 see van der Vlugt, R., 531
- Rossi, Thomas F.**
 Entropy Model for Consistent Impact-Fee Assessment, 1063
- Rossmanith, H. P.**
 see Linsbauer, H. N., 882, 883
- Rossow, E. C.**
 see Li, Zongjin, 891
- Rotter, J. Michael**
 Elastic Stability of Cylindrical Shells with Weld Depressions, 860
 Elastic Stability of Lap-Jointed Cylinders, 825
- Roufaei, Magdy S. L.**
 Microcomputer-Aided Analysis and Design of Steel Frames, 109
- Rouphail, Nagui M.**
 see Mousa, Ragab M., 1029
- Rozakis, Lee T.**
 see Brendecke, Charles M., 1115
- Rozen, Arnon**
 see Musacchio, John, 1230
- Rozvany, G. I. N.**
 Prager-Shield Optimality Criteria for Linear Segmentation, 273
- Ruff, James F.**
 see Maynard, Stephen T., 604
- Ruiz, Sonia E.**
 see Esteve, Luis, 802
- Rumberger, J.**
 see Chandran, K. B., 375
- Runesson, K.**
 Stability of Frictional Materials, 376
- Runesson, Kenneth**
 Characteristics and Computational Procedure in Softening Plasticity, 364
- Runge, Igor**
 Modeling Sodium and Chloride in Surface Streams During Base Flows, 177
- Runkle, George**
 Microcomputers: Investing in the Future, 1231
- Rush, Richard John**
 see Spice, Ian Edgar, 1213
- Russell, Henry A.**
 see Hansmire, William H., 454
- Russell, Henry G.**
 High-Strength Concrete: Weighing the Benefits, 1282
- Russo, Gaetano**
 see Papia, Maurizio, 808
- Rutherford, A. William**
 Organizational Evolution I-595 Port Everglades Expressway, 81
- Rutherford, J. C.**
 Management of Phosphorus and Nitrogen Inputs to Lake Rotorua, New Zealand, 1098
- Rutherford, Randall S.**
 see Yapa, Poojitha D., 103
- Rutherford, Scott R.**
 Avoiding Transportation Future Shock, 1189
- Ruyun, Luo**
 see Peicheng, Hu, 441
- Saadatmanesh, Hamid**
 Analytical Study of Prestressed Composite Beams, 927
 Experimental Study of Prestressed Composite Beams, 926
 Guidelines for Flexural Design of Prestressed Composite Beams, 962
- Saatçi, A. M.**
 Harmonic Mean Conductivity in Declining Rate Filters, 169
- Saatçioğlu, Murat**
 see Özcebe, Guney, 793
- Sack, R. L.**

- see Ebrahimpour, A., 875
- Sack, Ronald L.**
Designing Structures for Snow Loads, 804
- Sach, S.**
see Atkinson, R. H., 922
- Şafak, Erdal**
Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: I. Theory, 411
Adaptive Modeling, Identification, and Control of Dynamic Structural Systems: II. Applications, 412
- Saffir, Herbert S.**
see Liu, Henry, 25
see Perry, Dale C., 26
see Sparks, Peter R., 37
- Sabeh, S. Madina**
Ultimate Strength of RC Wall Panels in One-Way In-Plane Action, 943
- Saïdi, M.**
Five-Spring Element for Biaxially Bent R/C Columns, 809
- Sakakibara, Y.**
see Kuroda, M., 210
- Sakakiyama, Tsutomu**
Mass Transport Velocity in Mud Layer Due to Progressive Waves, 1162
- Sakamoto, Toshiyuki**
see Hasegawa, Akio, 866
- Salceh, A. F.**
see Arnold, S. M., 327
- Salch, Abul Fazal M.**
Groundwater Table Simulation Under Different Rice Irrigation Practices, 697
- Salcira, Wesley E.**
see Jeyapalan, Jey K., 1030
- Sama, George N.**
see Adebisi, Olusegun, 1036
- Samani, Zohrab**
Water Movement in Horizontally Layered Soils, 690
- Samani, Zohrab A.**
see Hargreaves, George H., 677
- Samra, Raed M.**
Predicting Deflections of Reinforced Concrete Beams Analytically, 855
- Samstag, Randal**
Automated Design of Wastewater Plants, 1228
- Samtani, N. C.**
Laboratory Tests of Strip Footing on Reinforced Cohesive Soil, 520
- San, Hasan Ali**
Analytical Approach for Evaluation of Settling Column Data, 168
- Sánchez, Remigio H. Galarraga**
see Georgakakos, Konstantine P., 1102
- Sandberg, L. Bogue**
Combined Stress Behavior of Structural Glazing Joints, 858
- see Bulleit, William M., 811
- Sanders, Steve R.**
see Thomas, H. Randolph, 82
- Sangrey, Dwight A.**
see Wu, Tien H., 455
- Sansalone, Mary**
see Carino, Nicholas, 42
see Wright, Richard N., 41
- Santamarina, J. C.**
Limitations in Decision Making and System Performance, 45
see Chameau, J. L., 118
see Goodings, D. J., 503
- Santaputra, C.**
Web-Crippling Strength of Cold-Formed Steel Beams, 936
- Sanvido, Victor E.**
Conceptual Construction Process Model, 18
see Thomas, H. Randolph, 82
- Saran, Swami**
Bearing Capacity of Footings Adjacent to Slopes, 477
Eccentrically-Obliquely Loaded Footing, 542
- Sarikaya, H. Z.**
see Abu-Rizaiza, O. S., 702
- Sarkani, Shahram**
see Voyiadjis, George Z., 320
- Sastri, Tep**
Rainfall Intervention Analysis for On-Line Applications, 1096
- Satish, Mysore G.**
Pressure Recovery in Dividing Open Channels, 610
- Sato, Naotsugu**
see Hasegawa, Akio, 866
- Saurer, Paul D.**
see Mueller, James A., 194
- Savage, William Z.**
see Amadei, Bernard, 295
- Savic, Dragan A.**
see Simonovic, Slobodan P., 125
- Sayed, Sayed**
see Goehring, Robert, 1290
- Sayed, Sayed M.**
Alternate Analysis of Pressuremeter Test, 548
- Scanlan, Robert H.**
Mitigation of Severe Wind Damage Related to Ground Transportation Systems, 38
see Corotis, Ross B., 229
see Kumarasena, Thusitha, 923, 924
- Scanlon, A.**
see Link, R. A., 365
- Schaefer, Daniel M.**
see Barlaz, Morton A., 207

- Schalge, Roger**
 see Fiore, John, 1239
- Scheader, C. Edward**
 Building in Reservoirs, 1179
- Schelling, D.**
 Construction Effects on Bracing on Curved I-Girders, 915
- Schiff, A. J.**
 see Tzou, H. S., 951
- Schmelz, Robert E.**
 HSR Cost Estimating Techniques in Pennsylvania, 1021
- Schmertmann, John H.**
 Density Tests Above Zero Air Voids Line, 502
- Schmidt, Richard J.**
 Modeling Laterally Loaded Light-Frame Buildings, 797
- Schmidt, Robert**
 Approximate Analysis of Twisted Parallelepiped, 275
 Lower Bounds for Eigenvalues via Rayleigh's Method, 346
- Schmitz, Gerd H.**
 Analytical Model of Level Basin Irrigation, 664
- Schnobrich, William C.**
 see Hu, Hsuan-Teh, 783
- Schnoor, Jerald L.**
 see Mossman, Deborah J., 181
- Schoellhamer, David**
 see Mehta, Ashish J., 615
- Schreyer, Howard L.**
 Smooth Limit Surfaces for Metals, Concrete, and Geotechnical Materials, 384
- Schreyer, Paul R.**
 see Forster, James F., 1265
- Schroeder, Dennis E.**
 Public Agency Peer Review: Case Study, 222
- Schroeder, Paul R.**
 see Peyton, R. Lee, 20
- Schulte, Bernard H.**
 Finding Qualified People in a Tight Labor Market, 748
- Schupack, Morris**
 Unbonded Performance, 1275
- Schuster, Otmar**
 see Beckmann, Angela, 1006
- Schwartz, Charles W.**
 see Rada, Gonzalo R., 1041
- Schwartz, David P.**
 Geologic Characterization of Seismic Sources, Moving into the 1990s, 3
- Scott, Ronald F.**
 Consolidation of Sensitive Clay as Phase Change Process, 527
 see Burrige, Paul B., 499
 see Levine, Marie B., 460
- Scribner, Charles**
 see Gross, James G., 43
- Seale, Sandra H.**
 Point Loads in Cross-Anisotropic Layered Half-spaces, 294
- Sebaaly, Peter E.**
 Performance of Full-Scale Pavements Under Accelerated Loading, 1040
- Seed, H. Bolton**
 Design Problems in Soil Liquefaction, 17
- Seelig, William N.**
 see Walton, Todd L., Jr., 1151
- Seidel, Michael J.**
 Seismic Damageability Assessment of R/C Buildings in Eastern U.S., 917
- Selig, Ernest T.**
 see Norman-Gregory, Gillian M., 462, 463
- Sellin, R. H. J.**
 see Hoyt, Jack W., 647
- Selna, Lawrence G.**
 Bridge Retrofit Testing: Hinge Cable Restrainers, 840
- Selvadurai, A. P. S.**
 Composite Infinite Element for Modeling Unbounded Saturated-Soil Media, 539
 Elastic Stiffness of Flat Anchor Region at Cracked Geological Interface, 263
- Selvalingam, S.**
 see Liong, S. Y., 674
- Selvappalam, Mohan**
 see Ekhande, Shantaram G., 813
- Semmens, Michael J.**
 see Zander, Amy K., 187
- Sen, Zekai**
 Nonlinear Flow Toward Wells, 561
- Sen, Zekai**
 Volumetric Approach to Multiaquifer and Horizontal Fracture Wells, 650
- Senseney, Jonathan A.**
 see Lin, T. D., 22
- Serhan, Samir J.**
 see Nayfeh, Ali H., 449
- Sens, Günther J.**
 see Schmitz, Gerd H., 664
- Shafer, Mark**
 see Knowles, Leel, 108
- Shah, S. P.**
 see Labuz, J. F., 382
 see Li, Zongjin, 891
- Shah, Surendra P.**
 see Alvarado, Manuel A., 285
 see John, Reji, 782
- Shahrivar, Farid**
 Signal Separation Method for Tower Mode Shape Measurement, 827

- Shamir, U.
see Zessler, U., 1118
- Shanley, E. M.
A Better Way, 1292
- Shanmugam, N. E.
Thin-Walled Steel Box Columns Under Biaxial Loading, 948
see Liew, J. Y. Richard, 888, 970
- Shanmuganayagam, Venayagampillai
Current Float Techniques for Resources Scheduling, 84
- Sharif, A. M.
see Baluch, M. H., 777
- Shark, Walter
see Fox, Gerard F., 1194
- Sharma, Satish C.
Cost of Driving Comfort and Convenience for Two-Lane Highways, 1034
Prediction of Design Hourly Volume from Road Users' Perspective, 1057
- Sharp, Wayne W.
see Ormsbee, Lindell E., 1081
- Shehata, Ibrahim A. E. M.
Punching in R.C. Slabs, 890
- Sheikh, Tauqir M.
Beam-Column Moment Connections for Composite Frames: Part I, 957
see Deierlein, Gregory G., 958
- Sheinman, Izhak
Cylindrical Buckling Load of Laminated Columns, 302
- Shelton, Stephen P.
see Bates, Marcia H., 225
- Shen, Hayley H.
see Babić, Marijan, 340
- Shea, Hung Tao
see Yapa, Poojitha D., 103
- Shen, L. David, ed.
see Ural, Oktay, ed., 1297
- Shenton, Harry W., III
PC-Based Data Acquisition System for Structural Monitoring, 123
- Shepherd, Robin
see Caserio, Alan K., 23
- Sherard, J. L.
Critical Filters for Impervious Soils, 498
- Sherrard, J. H.
see Gayle, B. P., 196
- Sherrard, Joseph H.
see Dishman, C. Michael, 233
see Lee, Dowon, 165
- Shewbridge, Scott E.
Deformation Characteristics of Reinforced Sand in Direct Shear, 509
- Shiau, Le-Chung
Wind Induced Vibration of Two Flexible Cylindrical Structures, 392
- Shieh, Wen K.
Performance and Kinetics of Aerated Fluidized Bed Biofilm Reactor, 145
- Shih, Sun F.
GOES Satellite Data in Rainfall Estimation, 721
- Shih, T. S.
On Static Modulus of Elasticity of Normal-Weight Concrete, 940
see Huang, X. P., 138
- Shilstone, James M.
A Hard Look at Concrete, 1178
- Shimada, Masashi
Graph-Theoretical Model for Slow Transient Analysis of Pipe Networks, 618
- Shimizu, Yasuyuki
Calculation of Bed Variation in Alluvial Channels, 572
- Shing, P. B.
Inelastic Behavior of Concrete Masonry Shear Walls, 918
- Shing, Pui-Shum B.
see Mahin, Stephen A., 913
- Shinozuka, M.
see Kardara, A., 370
- Shinozuka, Masanobu
see Deodatis, George, 420, 430
see Simulescu, Ion, 292
- Shirmohammadi, A.
Irrigated Agriculture and Water Quality in South, 718
- Shoemaker, W. Lee
Solving Low Enrollment Problems in Civil Engineering, 242
- Shrestha, Mandira
see Yeh, Harry H., 630
- Shuch, H. Paul
General Aviation Collision-Avoidance Alternatives, 1047
- Shukla, K. N.
see Khan, G. J., 696
- Shumway, R. H.
see Morkoc, F., 707
see Morkoo, F., 731
- Sibley, Keith
see Laier, James E., 1273
- Sidani, Maher
see Albrecht, Pedro, 892
- Siddharthan, Raj
see Maragakis, Emmanuel A., 928
- Sidi, Indra
see Tang, Wilson H., 269
- Sieffert, J. G.
see Billet, P., 506

- Sill, Benjamin L.**
see Crider, Steven S., 597
- Silvester, Richard**
Sines Revisited, 1145
see Hsu, John R. C., 1129, 1142, 1143
- Simites, George J.**
see Birman, Victor, 34
- Simiu, Emil**
see Carino, Nicholas, 42
- Simkowitz, Howard J.**
GIS: Technology for Transportation, 1233
- Simmonds, Sidney H.**
Effect of Support Movement on Hyperbolic Paraboloid Shells, 786
- Simonovic, Slobodan P.**
Intelligent Decision Support and Reservoir Management and Operations, 125
- Simpson, Wesley E.**
Fast Tracking Military Waste, 1203
- Simulescu, Ion**
Equivalent Linearization Method in Nonlinear FEM, 292
- Sin, Zekai**
Radial Flow in Vertically Graded Hydraulic Conductivity Aquifers, 651
- Sinai, G.**
see Pessen, D., 1124
- Sinclair, James P.**
see Arndt, Roger E. A., 626
- Singh, Krishan P.**
Hydraulic Geometry of Streams and Stream Habitat Assessment, 1108
- Singh, M. P.**
see Suarez, L. E., 265
- Singh, Mahendra P.**
see Suarez, Luis E., 278
- Singh, Vijay P.**
see Yu, Fang X., 729
- Sinha, Sachchidanand**
see Naraine, Krishna, 872, 944
- Sinnott, B. Walter**
see Scheader, C. Edward, 1179
- Sirosh, Saaananaan N.**
Reinforced Concrete Beam-Columns and Beams on Elastic Foundation, 824
- Sitar, Nicholas**
see Shewbridge, Scott E., 509
- Sivaneswaran, N.**
see Kramer, Steven L., 549
- Sive, A. W.**
Mixed-Regime Slurries in Pipelines; II. Experimental Evaluation, 640
- Skaggs, R. W.**
see Ritter, W. F., 719
- Skallerud, Bjørn**
Nonlinear Effects on Shakedown of Sidesway Frames, 798
- Skibniewski, Mirosław**
Robotic Roundup, 1222
- Skibniewski, Mirosław J.**
see Kakoto, Takao, 92
- Skorton, D. J.**
see Chandran, K. B., 375
- Skudrzyk, Frank J.**
Strength Characteristics of Frozen Fox Gravel, 132
- Slade, Lee**
Haunches and Hangers, 1199
- Sligo, Joseph C.**
see Durboraw, I. Newton, III, 999
- Sloat, Mark S.**
Sensitivity Study of Detention Basins in Urbanized Watershed, 1069
- Smallowitz, Howard**
Fired Up at Fort Drum, 1200
Making Amends with Nature, 1217
- Smerdon, Ernest T.**
Education—Key to Dealing with Social and Environmental Objectives, 1073
Improving Management of Technology, 760
- Smith, Bryan Stafford**
see Gaiotti, Regina, 830
- Smith, Daniel W.**
Cold Regions Environmental Engineering: Tomorrow's Challenges, 135
- Smith, Gary R.**
Estimating Precipitation Impacts for Scheduling, 96
- Smith, H. A.**
see Melosh, R. J., 296
- Smith, J. Dungan**
see Wiberg, Patricia L., 555
- Smith, James A.**
Water Supply Yield Analysis for the Washington Metropolitan Area, 1086
- Smith, John H.**
see Gross, John L., 51
- Smith, Joseph L.**
see Krauthammer, Theodor, 833
- Snyder, Herman P.**
see Whitaker, Raymond L., 1190
- Snyder, W. H.**
see Roberts, Philip J. W., 550, 551, 552
- Sobey, Rodney J.**
Complex Envelope of Surface Gravity Waves, 1166
Mean Flow Circulation Equations for Shoaling and Breaking Waves, 280
- Sohal, Iqbal S.**
Design Interaction Equations for Steel Members, 885
- Solari, Giovanni**
Wind Response Spectrum, 390

- Soler, Tomás**
Important Parameters Used in Geodetic Transformations, 1013
- Sollman, M.**
see Kennedy, John B., 810
- Song, Charles C. S.**
see Cardle, James A., 559
- Sonnen, Michael B., ed.**
see Roesner, Larry A., ed., 1314
- Sonpal, R. C.**
see Samtani, N. C., 520
- Soong, T. T.**
see Chung, L. L., 363
see Rodellar, J., 339
- Sopcich, Dennis**
see Bagchi, Amalendu, 167
- Sorensen, Kenneth E.**
see Carter, Edward F., 438
- Sořic, Zorislav**
Bond Stress/Deformation in Pull-Out Masonry Specimens, 941
- Southerlan, Robert E.**
see Osborne, Michael C., 175
- Sozen, Mete A.**
see Kreger, Michael E., 971
- Spach, H.**
see Shing, P. B., 918
- Spanos, P. D.**
Stochastic Finite Element Expansion for Random Media, 326
- Sparks, Peter R.**
Wind Damage to Masonry Buildings, 37
see Liu, Henry, 25
- Spengemann, F.**
see Rozvany, G. I. N., 273
- Spice, Ian Edgar**
Coal Gas Legacy, 1213
- Spillers, William R.**
see Levy, Robert, 367
- Sproule, William J., ed.**
see Bondada, Murthy V. A., ed., 1299
- Spyrakos, C. C.**
Assessment of Computational Practices in Dynamic Soil-Structure Interaction, 110
- Squires, Rodney C.**
Economics of Selenium Removal from Drainage Water, 662
- Sraders, Gregory A.**
see Elsbury, Bill R., 1209
- Staab, G. H.**
see El-Tahan, W. W., 322
- Staab, Gordon E.**
Construction of Port and Facilities on Horn of Africa—Lessons Learned, 63
- Stakhiv, Eugene Z., ed.**
see Haimes, Yacov Y., ed., 1330
- Stakhiv, Eugene Z.**
see Hobbs, Benjamin F., 1070
- Staley, Richard A., ed.**
see Chatterjee, Arun, ed., 1319
- Stathopoulos, Theodore**
Transient Wind-Induced Internal Pressures, 355
- Stauble, Donald K.**
Barrier Islands: Process and Management, 1301
- Steele, John A.**
see Logan, Bruce E., 154
- Steenhuis, Tammo S.**
see Saleh, Abul Fazal M., 697
- Stefan, Heinz G.**
Negatively Buoyant Flow in a Diverging Channel. III: Onset of Plunging Underflow, 575
see Johnson, Thomas R., 576
- Stelson, Kim**
see Maniatty, Antoinette, 342
- Stephenson, D.**
Selection of Stormwater Model Parameters, 153
- Stephenson, R. W.**
see Uppot, Janardanan O., 452
- Sterling, R. L.**
see Yang, L., 511
- Sterling, Raymond L.**
see Inada, Yoshinori, 480
- Stevens, David J.**
Nonlocal Continuum Damage/Plasticity Model for Impulse-Loaded RC Beams, 925
- Stevens, David K.**
Dynamic Model of Nitrification in a Fluidized Bed, 195
- Stevens, James D.**
Contractor Financing, Public Works in Saudi Arabia, 60
- Stevens, Michael A.**
Width of Straight Alluvial Channels, 568
- Stewart, Mark G.**
Checking Models in Structural Design, 864
Optimization of Structural Design Checking, 932
- Stewart, Michael B.**
see Swean, Thomas F., Jr., 646
- Stiffler, Price E.**
see Matsumoto, Junji, 1082
- Stoddard, A. T.**
see Eschenbach, Ted G., 127
- Stoman, Sayed H.**
Effective Length Spectra for Cross Bracings, 972
- Stone, William C.**
see Carino, Nicholas, 42
see Gross, James G., 43
see Yokel, Felix Y., 44

- Stow, Douglas**
 see Chang, Howard H., 1144
- Strachan, C. L.**
 see Miller, L. L., 444
- Strange, William E.**
 GPS Determination of Ground Water Withdrawal Subsidence, 993
- Strauber, B. G.**
 see Bognár, L., 889
- Stukhart, George**
 Construction Materials Quality Management, 47
 Continuing Education for Engineers: University's Role, 255
- Sture, S.**
 see Atkinson, R. H., 922
 see Runesson, K., 376
- Sture, Stein**
 see Runesson, Kenneth, 364
- Sturm, Terry W.**
 see Luetlich, Richard A., Jr., 628
- Su, Lin**
 Comparative Study of Base Isolation Systems, 385
 see Orabi, Ismail I., 264
- Suarez, L. E.**
 Dynamic Synthesis of Nonclassically Damped Substructures, 265
- Suarez, Luis E.**
 Floor Spectra With Equipment-Structure-Equipment Interaction Effects, 278
- Sud, V. K.**
 see Saran, Swami, 477
- Sugiura, K.**
 see Chang, K. C., 291
- Suidan, M. T.**
 see Traegner, U. K., 148
- Suidan, Makram**
 see Liehr, Sarah K., 159
- Sulfide Task Group of the Water Pollution Management Committee of the Environmental Engineering Division of the American Society of Civil Engineers**
 Sulfide in Wastewater Collection and Treatment Systems, 1338
- Sulisz, Wojciech**
 see McDougal, William G., 1168
- Sumer, B. Mutlu**
 Response of Marine Pipelines in Scour Trenches, 1155
- Summers, Curtis D.**
 Screaming Structures, 1277
- Supalla, Raymond J.**
 see Martin, Derrel L., 663
- Suzuki, Yutaka**
 Impact Analyses of Construction of Kansai International Airport, 1062
- Sveegen, Olav**
 see Wagner, David A., 1137
- Swean, Thomas F., Jr.**
 Turbulent Surface Jet in Channel of Limited Depth, 646
- Swift, M. Robinson**
 Collision Tolerant Pile Structure Hinge Concepts, 1132
- Symonds, P. S.**
 see Perego, U., 434
- Synolakis, Costas Emmanuel**
 Determining Hydrodynamic Force on Accelerating Plate in Fluid with Free Surface, 416
- Szumko, S.**
 Mechanical Model for Oscillating Water Column with Compressibility, 377
- Tabatabaee, Nader**
 see Sebaaly, Peter E., 1040
- Tadjbakhsh, Iradj G.**
 see Su, Lin, 385
- Tagawa, Yasuhisa**
 Behavior of Composite Beams in Steel Frame Under Hysteretic Loading, 908
- Takanashi, Koichi**
 Behaviors of Steel and Composite Beams at Various Displacement Rates, 910
- Takeda, Fumiaki**
 see Reed, Brian E., 193
- Takewaki, Izuru**
 see Nakamura, Tsuneyoshi, 821
- Tallin, A. G.**
 Limitations of Type II Models for Seismic Hazard, 844
- Tamai, Nobuyuki**
 see Asaeda, Takashi, 569
- Tan, K. H.**
 see Lee, S. L., 945
- Tan, Willie**
 Free Net Analysis Under Squared Error Loss, 1009
- Tanabe, Tada-aki**
 see Yoshikawa, Hiromichi, 831
- Tanaka, Hitoshi**
 Bottom Boundary Layer Under Nonlinear Wave Motion, 1127
- Tang, Shin Ru**
 see Crittenden, John C., 174
- Tang, Wilson H.**
 Average Property in Random Two-State Medium, 269
 see Wu, Tien H., 455
- Tang, Xiaodong**
 Brace Fractures and Analysis of Phase I Structure, 904
- Tanigawa, Yasuo**
 Analytical Study on Deformation of Fresh Concrete, 293
- Tao, Tao**

- Remote Sensing and Fully Distributed Modeling for Flood Forecasting, 1122
- Taoka, George T.**
Civil Engineering Design Professors Should be Registered Engineers, 240
- Tarquin, Anthony J.**
Optimal Pump Operation in Water Distribution, 558
- Tarricone, Paul**
The Asbestos Agenda, 1266
Big Trouble in Little America, 1249
Building the Perfect Playpen, 1281
Top Projects for 1989, 1240
- Tarzikhian, Charbel**
see French, Catherine Wolfgram, 805
- Task Committee on Guidelines for Failure Investigation, Technical Council on Forensic Engineering**
Guidelines for Failure Investigation, 1321
- Task Committee on Risk and Reliability Analysis of Water Distribution Systems of the Committee on Probabilistic Approaches to Hydraulics of the Hydraulics Division of the American Society of Civil Engineers**
Reliability Analysis of Water Distribution Systems, 1328
- Task Committee on Software Evaluation of the Technical Council on Computer Practices of the American Society of Civil Engineers**
Guide for Evaluating Engineering Software, 1320
- Task Committee on Water Requirements of Natural Vegetation, Committee on Irrigation Water Requirements, Irrigation and Drainage Division, American Society of Civil Engineers**
Water Use by Naturally Occurring Vegetation: An Annotated Bibliography, 1343
- Tassoulas, J. L.**
see Hatzikonstantinou, E., 471
- Tassoulas, John**
see Fotopoulou, Martha, 472
- Tatum, C. B.**
Management Challenges of Integrating Construction Methods and Design Approaches, 744
Managing for Increased Design and Construction Innovation, 766
Organizing to Increase Innovation in the Construction Firm, 99
Process of Innovation for Up/Down Construction at Rows Wharf, 70
see Hansen, Karen Lee, 740
see Howard, H. C., 102
see Nam, C. H., 93
- Tavakoli, Amir**
Equipment Policy of Top 400 Contractors: A Survey, 79
- Tay, Joo-Hwa**
Sludge Ash as Lightweight Concrete Material, 144
- Taye, Emmanuel D.**
see Tavakoli, Amir, 79
- Tayfun, M. Aziz**
Envelope, Phase, and Narrow-Band Models of Sea Waves, 1161
Wave Envelope and Related Spectra, 1157
- Taylor, Peter T.**
see Beck, Norman, 992
- Technical Committee on Contracting Practices of the Underground Technology Research Council, sponsored by the American Society of Civil Engineers (Construction Division) and the American Institute of Mining Engineers**
Avoiding and Resolving Disputes in Underground Construction, 1300
- Teclé, A.**
see Duckstein, L., 445
- Teeter, Allen M.**
see Mehta, Ashish J., 614, 615
- Temple, D. M.**
see Powledge, George R., 612, 613
- Teng, Jin-Guang**
see Rotter, J. Michael, 825, 860
- Terrell, M. Palmer**
see Changchit, Chaweng, 1113
- Terry, Philip**
Verifying Software by Use, 1223
- Testerman, Nile**
see Lung, Wu-Seng, 199
- Thatcher, Frederick C.**
see Samstag, Randal, 1228
- Thériault, I.**
see Ouellet, Yvon, 1147
- Thevanayagam, S.**
New Basis for Earthwork Specification for Clay Soil, 537
- Thewalt, Christopher R.**
see Mahin, Stephen A., 913
- Thicke, Robert J.**
see Sobey, Rodney J., 280
- Thiyagaram, Michael**
see Jeyapalan, Jey K., 1030
- Thomas, H. Randolph**
Impact of Material Management on Productivity—A Case Study, 82
- Thomas, Ronald J., Jr.**
see Yapa, Poojitha D., 103
- Thomason, William H.**
see Hanna, Shaddy Y., 1135
- Thompson, James F.**
see Frishman, Steve, 1205
- Thooayamani, K. P.**
Equations Describing Sprinkler Droplet Velocity, 670
- Tighe, Michael**
Parking Garage Crisis, 1262
- Ting, John M.**
Discrete Numerical Model for Soil Mechanics, 467

AUTHOR INDEX

Tzou

Tingsanchali, Tawatchai

Optimum Diversion Plan for Hydropower Scheme, 1084

Stability Analysis of Two-Dimensional Depth-Averaged Model, 620

Tin-Loi, Francis

see Wakefield, Ron R., 961

Tinney, J. Craig

see Agthe, Donald E., 1123

To, C. W. S.

see Wu, A. K. H., 517

Tobia, L. Thomas, Jr., ed.

see Magoon, Orville T., ed., 1304

Todd, David A.

Impact of Land Use and NPS Loads on Lake Quality, 179

Todorovska, M. I.

Antiplane Earthquake Waves in Long Structures, 428

Seismic Waves in Buildings with Shear Walls Or Central Core, 427

Tolliver, James M.

see Ircha, Michael C., 746

Torum, Alf

Wave Forces on Pile in Surface Zone, 1159

Totten, Peter A.

see Fiore, John, 1239

Touran, Ali

Application of Robotics in Bridge Deck Fabrication, 62

see Karaa, Fadi A., 767

Townsend, F. C.

see McVay, M. C., 496

Townsend, Frank C.

Clay Waste Pond Reclamation by Sand/Clay Mix or Capping, 540

Townsend, Ronald D.

see Morse, Brian, 594

Townson, J. M.

Models of Dam-Break Flow in *R-T* Space, 584

Tracy, Fred T.

Automatic Generation of Seepage Flow Nets by Finite Element Method, 119

Tracy, Gerald R.

see Fellenius, Bengt H., 501

Tracy, John C.

Management Model for Control of On-Farm Irrigation, 727

Solute Movement Through Root-Soil Environment, 703

Tracy, Terence M.

Mitigation of Damages to Electric Utilities Due to High Winds, 28

Traegner, U. K.

Parameter Evaluation for Carbon Adsorption, 148

Tran, Duc Minh

see Ramamurthy, A. S., 678

Tranquilla, James M.

GPS Antenna Design Characteristics for High-Precision Applications, 978

Traver, A. E.

see Hughes, P. J., 85

Traves, Warren H.

see Kitipornchai, Sritawat, 975

Treman, Paul A.

CAD Speeds Viaduct Replacement, 1252

Trifunac, M. D.

see Todorovska, M. I., 428

Tripp, Denise Wilton

Evaluation of Deep Pumping Tests, 484

Trotsky, Michael S.

Prestressed-Steel Continuous-Span Girders, 867
Pre-Tensioned and Posttensioned Composite Girders, 974

Truitt, Clifford L.

Considerations for Capping Subaqueous Dredged Material Deposits, 1169

Trussel, R. Rhodes

see Jacangelo, Joseph G., 1220

Tsai, Chong-Shien

Hydrodynamic Pressure on Gravity Dams Subjected to Ground Motions, 299

Tsanis, Ioannis K.

Simulation of Wind-Induced Water Currents, 616

Tsay, Ting-Kuei

see Rice, Dale A., 1099

Tucci, C. E. M.

Hydrodynamic Analysis of Floods in Urban System, 1105

Tulin, Leonard G.

see Sotic, Zorislav, 941

Tung, David

see Iranpour, Reza, 1025

Tung, Yeou-Koung

see Lansey, Kevin E., 1111

Turkington, D. H.

Design Method for Bridges on Lead-Rubber Bearings, 966

Seismic Design of Bridges on Lead-Rubber Bearings, 965

Turner, E. J.

see Peterka, J. A., 24

Turner, Earl J.

see Liu, Henry, 36

Tyler, David A.

see Lambert, Steven R., 988

Tyson, Betty

Facilities Management With CADD, 1232

Tzou, H. S.

Dynamics and Control of Elevators with Large Gaps and Rubber Dampers, 951

Uang, Chia-Ming

see Bertero, Vitelmo V., 899

see Whittaker, Andrew S., 796

Udagawa, Kuniaki

see Takashi, Koichi, 910

Udwadia, Firdaus E.

Super Image-Management: Growing Concern for Productivity Decline, 752

Ueda, Minoru

see Hasebe, Norio, 431

Uhlman, Kristine

Hydrogeology Comes to the Surface, 1210

Ulrich, Edward J., Jr.

Internally Braced Cuts in Overconsolidated Soils, 474

Tieback Supported Cuts in Overconsolidated Soils, 475

Uppot, Janardanan O.

Permeability of Clays Under Organic Permeants, 452

Ural, Oktay, ed.

Affordable Housing: a Challenge to Civil Engineers, 1297

Urbonas, Ben, ed.

see Roesner, Larry A., ed., 1314

Urish, Daniel W.

see Runge, Igor, 177

Usuki, Seizon

see Hasebe, Kaoru, 316

Uzan, Jacob

Experiment Design Approach to Nondestructive Testing of Pavements, 1049

Valdes, Juan B.

see Sastri, Tep, 1096

Vallejo, Luis E.

Fissure Parameters in Stiff Clays Under Compression, 518

van der Vegt, Jan Willem

Differential GPS: Efficient Tool in Photogrammetry, 1001

van der Vlugt, R.

Chart for Allowable Soil Pressure Based on Schmertmann's Method, 531

Van Evra, Robert, III.

see Bedford, Keith W., 8

Van Volkinburg, David

see Tighe, Michael, 1262

Vandiver, J. Kim

Hydrodynamic Damping on Flexible Cylinders in Sheared Flow, 1134

VanWijk, Adriaan J.

Pumping Prediction Model for Highway Concrete Pavements, 1026

Veletos, Anestis S.

Seismic Interaction of Structures and Soils: Stochastic Approach, 841

Veneziano, Daniele

see Honjo, Yusuke, 450

Verley, Richard L. P.

Hydrodynamic Forces on Seabed Pipelines, 1136

Verma, Dharendra

Calibration of Bridge-Strength Evaluation Code, 879

Vetter, Betty M.

Finding and Keeping Technical Experts in the 1990s, 738

Vgenopoulou, Irene

see Beskos, Dimitri E., 324

Vick, Steven G.

Risk Analysis for Dam Design in Karst, 492

Vide, J. P. Martin

see Rodellar, J., 710

Viessman, Warren, Jr.

Technology, Society, and Water Management, 1074

Vigrass, L. W.

Geothermal Energy Applications in Wastewater Treatment, 129

Villaverde, Roberto

Scheme to Improve Numerical Analysis of Hysteretic Dynamic Systems, 799

Vince, C. Roy

Unified Risk Insurance: An Update, 57

Vincent, Charles L.

Refraction-Diffraction of Irregular Waves Over a Mound, 1141

Vincent, Georges

Breakwater Choices, 1243

Vinson, Ted S.

see Celorie, Jay A., 171

Viraraghavan, T.

see Vigrass, L. W., 129

Vo, Diep Ngoc

see Ramamurthy, A. S., 360

Voelker, Richard

Power Without Acid, 1237

Vogel, Richard M.

Low-Flow Frequency Analysis Using Probability-Plot Correlation Coefficients, 1092

see Reuss, Mark C., 251

Voigt, Richard L., Jr.

see Arndt, Roger E. A., 626

von Bernuth, R. D.

Friction Factors for Small Diameter Plastic Pipes, 560

Vongvisessomjai, Suphat

Interaction of Tide and River Flow, 1130

see Tingsanchai, Tawatchai, 620

Voyiadis, George Z.

Engineering Large Deflection Theory for Thick Plates, 320

Wafa, Faisal F.

AUTHOR INDEX

Wen

Prestressed Concrete Beams with Opening Under Torsion and Bending, 949

Wagle, V.

see Chandran, K. B., 375

Wagner, David A.

Pipe-Soil Interaction Model, 1137

Wai, Onyx

see Bedford, Keith W., 8

Wake, Akio

see Reed, Brian E., 193

Wakefield, Ron R.

Shakedown of Grids Under Combined Bending and Torsion, 961

Wall, John F.

Strategic Defense Initiative Six Years Later in the Army, 30

Wallace, Benjamin J.

Small-Scale Model Tests of Structural Steel Assemblies, 906

Walls, W. Brian

see Wurbs, Ralph A., 1097

Walsh, Richard

New Wharf Covers Trident Submarines, 1182

Walski, Thomas M.

see Ormsbee, Lindell E., 1081

Walter, Michael F.

see Saleh, Abul Fazal M., 697

Walton, D. J.

Computer-Aided Design for Horizontal Alignment, 1042

Walton, Todd L., Jr.

Maximum Periodic Wave Run-up on Smooth Slopes, 1167

Wave Overtopping Generated Flow Through Off-shore Breakwater Gaps, 1151

Wan, Yonghua

Optimal Sequencing of Development for Hydro-power Stations in Cascade, 1095

Wang, C. M.

Basic Problem on Optimal Spatial Cable Layout, 330

Wang, Chien-Ming

New Set of Buckling Parameters for Monosymmetric Beam-Columns/Tie-Beams, 876

Wang, J. -Y.

see Heinrich, S. M., 297

Wang, Keh-Han

Free-Surface Flow Produced by Accelerating Vertical Cylinder, 359

Wang, Ming-Teh

see Logcher, Robert D., 71

Wang, Sam S. Y., ed.

Sediment Transport Modeling, 1331

Wang, Shien T.

see Hill, Christopher D., 839

Wang, Yi-Tin

Effects of Preozonation on Anaerobic Biodegradability of O-Cresol, 160

Warne, R. Thomas

Deck Park Covers Phoenix Freeway, 1184

Warrick, A. W.

Calculation of Distribution and Efficiency for Nonuniform Irrigation, 708

Wartel, Sidney J.

Negotiating and Drafting the Civil Engineering Contract, 756

Watabe, Makoto

see Yamanouchi, Hiroyuki, 901

Watkins, Dale A.

see Johns, Gerald E., 660

Watts, Richard J.

see French, Richard H., 192

Wawrzynek, P. A.

see Linsbauer, H. N., 882, 883

Wayson, R. L.

Noise and Air Pollution of High Speed Rail Systems, 1016

Weaver, William

A Seawall for Sea Mammals, 1183

Weber, A. Scott

see Lange, Clifford R., 204

Weber, Walter J., Jr.

see Grasso, Domenic, 173

Weems, Lynn

see Nard, Georges Pierre, 991

Weeraratne, Saroj P.

see Chang, Ching S., 311

Wei, X.

see Cheng, S., 334

Weigel, Terence A.

Load Redistribution in Frame with Settling Footings, 106

Well, Gary

Detecting the Defects, 1263

Weimar, Klaus

see Rajasekaran, Sundaramoorthy, 877

Weisman, Richard N.

Model Study of Safety Grating for Culvert Inlet, 1024

Weissman, Samuel

see Warne, R. Thomas, 1184

Wekezer, Jerzy W.

Vibrational Analysis of Thin-Walled Bars with Open Cross Sections, 963

Wen, Robert K.

Incremental Resistance and Deformations of Elastoplastic Beams, 861

Wen, Y. K.

System Reliability Under Time Varying Loads: I, 312

System Reliability Under Time Varying Loads: II, 313

- West, J. R.**
Turbulence Measurements of Suspended Solids Concentration in Estuaries, 577
- Wethington, Robert L.**
Establishment of the Kansas City GPS Control Network, 997
- Wets, Roger J-B**
see Gates, Timothy K., 694
- Whiffin, Robert Brian**
see Spice, Ian Edgar, 1213
- Whitaker, Raymond L.**
New Piers for an Old Bridge, 1190
- White, Charles R.**
Productivity Measurement: Untangling White-Collar Web, 764
- White, E.**
see Rutherford, J. C., 1098
- Whiting, David**
see Russell, Henry G., 1282
- Whitlatch, E. Earl**
Spatial Adequacy of NASQAN Water Quality Data in Ohio River Basin, 151
- Whitley, R. J.**
see Hromadka, T. V., II, 583
- Whittaker, Andrew S.**
Experimental Behavior of Dual Steel System, 796
- Wiberg, Patricia L.**
Model for Calculating Bed Load Transport of Sediment, 555
- Wiesenfeld, James D.**
Glitches in Flitch Beam Design, 1260
- Wiesner, Mark R.**
Membrane Filtration of Coagulated Suspensions, 142
- Wiley, Anthony G.**
see Wong, Kam W., 998
- Wilkinson, David L.**
see Witheridge, Grant M., 574
- Willam, Kaspar**
see Pramono, Eddy, 336
- Willardson, Lyman**
see Samani, Zohrab, 690
- Williams, A. N.**
see Ghalayini, S. A., 1173
- Williams, David John**
Geotechnical Input to a Major Bridge Project, 464
- Williams, David T.**
Applicability Index for Sand Transport Equations, 644
see Beverage, Joseph P., 654
- Williams, Frederic W.**
Exact or Lower Bound Tapered Column Buckling Loads, 851
- Williams, Jerry G.**
see Hanna, Shaddy Y., 1135
- Willis, Robert**
Water Resources Management in North China Plain, 1109
- Wills, John**
see Crisfield, Michael A., 298
- Wilmański, Krzysztof**
Adsorption Kinetics in GAC Systems for Water Treatment, 147
- Wilson, James E.**
see Kim, Ok-Kee, 1038
- Wilson, Kenneth C.**
Mobile-Bed Friction at High Shear Stress, 598
- Wilson, L. G.**
see Guzman, A. G., 649
- Wilson, P. G., Jr.**
see Britson, Wes, 1293
- Wilson, Tonya**
see von Bernuth, R. D., 560
- Wipf, Terry J.**
see Abendroth, Robert E., 935
- Witczak, Matthew W.**
see Rada, Gonzalo R., 1041
- Witheridge, Grant M.**
Density Measurement of Particle and Flocc Suspensions, 574
- Witten, Alan J.**
see King, W. Chris, 172
- Wolde-Tinsae, Amde M.**
Asymmetrical Buckling of Prestressed Tapered Arches, 388
- Wolfe, Ronald W.**
see Cramer, Steven M., 942
- Wong, Kai S.**
Lateral Wall Deflections of Braced Excavations in Clay, 494
- Wong, Kam W.**
GPS-Guided Vision Systems for Real-Time Surveying, 998
- Woo, H. K.**
see Khor, C. H., 468
- Woo, Hyo Seop**
see Beskos, Dimitri E., 325
- Wood, Leonard P.**
Combined Photogeodesy and GPS Network, 990
- Woodbury, Lawrence H.**
Estimating Terminal Lake Level Frequencies, 1091
- Woods, Greg J.**
see Bulleit, William M., 811
- Woods, Sandra L.**
see Celorie, Jay A., 171
- Woodward, Clinton**
Further Studies on Elastic Properties of Douglas Fir, 770
- Worman, Anders**
Riprap Protection Without Filter Layers, 648

AUTHOR INDEX

Yitayew

Wortley, C. Allen

Engineers Legislative Alliance of Wisconsin (ELAW), 256

Wortman, Randal T.

Spillway Discharge Calculations in NWS DAMBRK, 607

Wright, David R.

see Bell, Glenn R., 56

Wright, Jeff R.

see Diamond, James T., 1065

Wright, Raymond M.

see Runge, Igor, 177

Wright, Richard N.

Assessment: U.S. Office Building in Moscow, 41

see Carino, Nicholas, 42

see Gross, John L., 51

see Yokel, Felix Y., 44

Wu, A. K. H.

Validity of Smith Model in Pile Driving Analysis, 517

Wu, Jianping

Study of Inelastic Spectra With High Damping, 871

Wu, Tien H.

Reliability of Offshore Foundations: State of the Art, 455

Wu, Zhishen

see Yoshikawa, Hiromichi, 831

Wunderlich, A.

see Ganoulis, J., 621

Wurbs, Ralph A.

Water Rights Modeling and Analysis, 1097

Wurjanto, Andojo

see Kobayashi, Nobuhisa, 1139, 1165

Wyrick, David A.

Remote Oil and Gas Facility Construction, 73

Xia, Yi-Min

see Hsu, John R. C., 1142, 1143

Xiang, Li

see Peicheng, Hu, 441

Xiaofeng, Yang

Shakedown Analysis in Plastic Design of Steel Structures, 281

Xie, J. R.

see Chen, Y. Z., 303

Xie, Qi

see Li, Wei, 425

Xingkui, Wang

Turbulence Characteristics of Sediment-Laden Flow, 595

Yamada, Seishi

Buckling Behavior of Pressure Loaded Cylindrical Panels, 283

Yamanouchi, Hiroyuki

Seismic Behavior of Full-Scale Concentrically Braced Steel Building Structure, 901

see Fukuta, Toshibumi, 907

see Midorikawa, Mitsumasa, 902

Yamazaki, Yutaka

Reliability of Pseudodynamic Test in Earthquake Response Simulation, 912

Yancheski, Tad B.

Suburban Superfund, 1206

Yanev, B.

The Elusive Engineering Style, 257

Yang, G.

see Rahuel, J. L., 641

Yang, L.

Back Analysis of Rock Tunnel Using Boundary Element Method, 511

Yang, T. Y.

see Liaw, D. G., 403

Yang, Yeong-Bin

Curved Beam Elements for Nonlinear Analysis, 314
Stability of Pretwisted Bars with Various End Torques, 304

Yield Surfaces for I-Sections with Biomoments, 968

see Leu, Liang-Jenq, 354

Yankelevsky, David Z.

Loads on a Rigid Box Buried in a Nonlinear Medium, 1046

Uniaxial Behavior of Concrete in Cyclic Tension, 795

Yamaz, A. Melih

see Ergin, Aygen, 1160

Yannopoulos, Panayotis C.

see Noutsopoulos, George C., 553

Yao, Tse-Min

Shape Optimal Design of Arch Dam, 929

Yap, Sook Foong

see Lam, Yow Thim, 757

Yapa, Poojitha D.

Microcomputer Model for Oil Spill Simulation (MICROSS), 103

Yari, Nassar

see Behr, Richard A., 814

Yates, J. K.

Training Expatriate Engineering Professionals, 755

Yau, Jong-Dar

see Yang, Yeong-Bin, 304

Yeh, Harry H.

Free-Surface Flow Through a Screen, 630

Yeh, Hund — Der

Step-Drawdown Data Analysis, 634

Yip, Woon-Kwong

see Tay, Joo-Hwa, 144

Yitayew, M.

see Warrick, A. W., 708

Yitayew, Mulunch

Head Loss in Manifold or Trickle Lateral: Simplified Approach, 715

Yokel, Felix Y.

Energy Transfer Mechanism in SPT, 521

Progressive Collapse: U.S. Office Building in Moscow, 44

see Carino, Nicholas, 42

Yoon, Sung B.

Stem Waves Along Breakwater, 1163

Yoshida, Tetsuji

see Kangari, Roozbeh, 77

Yoshikawa, Hiromichi

Analytical Model for Shear Slip of Cracked Concrete, 831

Yost, R. W.

see Mossbarger, W. A., Jr., 717

Young, Alan

Mathematical Modeling of Landfill Gas Extraction, 206

Young, Cynthia A.

see Treman, Paul A., 1252

Young, Robert C. Y., ed.

Selected Papers from Chinese Journals of Structural Engineering, 1333

Young, William

Application of VADAS to Complex Traffic Environments, 1050

Youssef-Agha, W.

Seismic Response of Low-Rise Steel Frames, 820

Yu, Fang X.

Analytical Model for Border Irrigation, 729

Yu, G. -H.

see Rao, A. Ramachandra, 682

Yu, W. W.

see Santaputra, C., 936

Yuan, Mingshun

see Cardle, James A., 559

Yura, Joseph A.

see Deierlein, Gregory G., 958

see Grimm, Clayford T., 815

see Sheikh, Tauqir M., 957

Zabaras, Nicholas

see Maniatty, Antoinette, 342, 401

Zabitski, Ronald

Presented in 3-D, 1226

Zander, Amy K.

Membrane/Oil Stripping of VOCs from Water in a Hollow-Fiber Contactor, 187

Zarling, John P.

see Carlson, Robert F., 139

Zaslavsky, Aron

Residual Stresses in Beams with Yielding During Unloading, 829

Zayas, Inna

see Mathews, Alexander P., 143

Zebovitz, S.

Injection of Fine Sands with Very Fine Cement

Grout, 545

Zeiss, Chris

Property-Value Guarantees for Waste Facilities, 1068

Waste Facility Impacts on Residential Property Values, 1064

Zelinski, Ray J.

see Selna, Lawrence G., 840

Zenobia, Clark

see Cook, David, 1289

Zerbe, Hikmat E.

Seismic Response of Connections in Two-Bay R/C Frame Subassemblies, 955

Zessler, U.

Optimal Operation of Water Distribution Systems, 1118

Zhana, G. Y.

see Lee, Y. C., 1003

Zhang, Daoshuai

see Willis, Robert, 1109

Zhang, Shu-lu

see Chen, Yu-jiong, 541

Zhang, Yan

Eigenproperties of Classically Damped MDOF Composite Systems, 356

see Harichandran, Ronald S., 357

Zhangyuan, Ni

see Harmon, Thomas G., 854

Zhao, Zidan

see Jiang, Lin, 1146

Zheng, Shuhai

see Novotny, Vladimir, 631

Zhongfa, Wu

see Peicheng, Hu, 441

Zhu, Cheng

Contribution of Gaussian Curvature to Strain Energy of Plates, 350

Zicha, Jan H.

High-Speed Rail Track Design, 1020

Zielinski, Zenon A.

see Troitsky, Michael S., 867, 974

Zilkoski, David B.

GPS Satellite Surveys and Vertical Control, 1000

Zimmer, David T.

see Bowen, James D., 617

Zirschky, J.

Effect of Wastewater Application Device on Ammonia Volatilization, 218

Zografos, Konstantinos G.

Multi-Objective Programming Approach for Routing Hazardous Materials, 1058

Zoino, William

Cautious Risk Taking, 1271

Zozaya-Gorostiza, Carlos

see Hendrickson, Chris, 114

AUTHOR INDEX

Zytner

Zufelt, Jon E.

Is Advanced Technology "The Gateway to Irresponsibility?", 259

Zuniga, Edgar

see Hargreaves, George H., 677

Zuras, C. Milton

Rebuilding Philadelphia's El, 1187

Zureick, A. H.

Spheroidal Cavity with Prescribed Asymmetric Traction in Three-Dimensional Transverse Isotropy, 10

Spheroidal Cavity with Prescribed Asymmetric Displacements in Three-Dimensional Transverse Isotropy, 413

Zytner, Richard G.

PCE Volatilized from Stagnant Water and Soil, 215